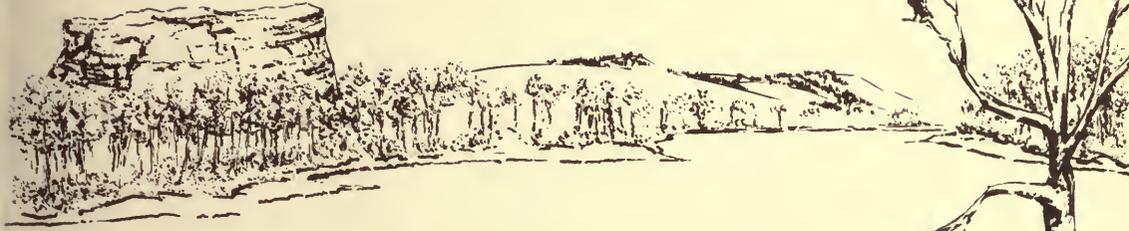


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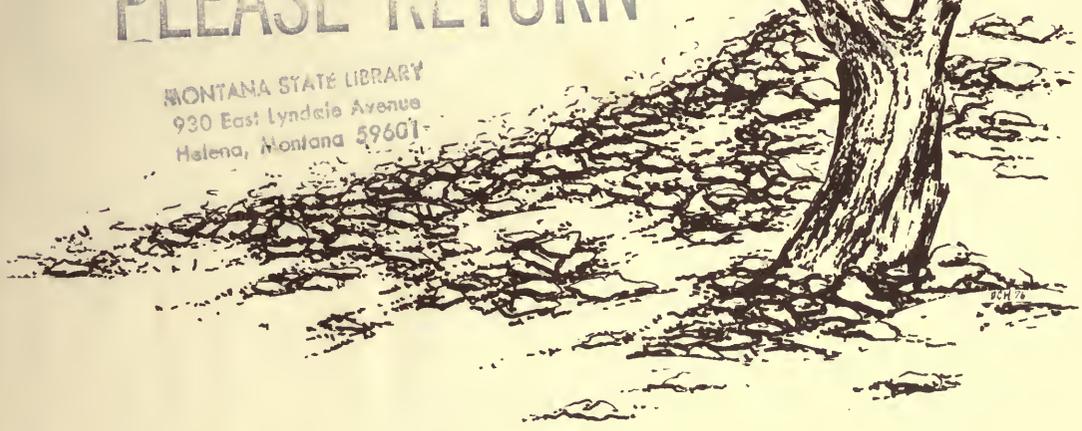


FINAL
ENVIRONMENTAL IMPACT STATEMENT

FOR
WATER RESERVATION APPLICATIONS

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January 31, 1977

Transmitted herein is the Final Environmental Impact Statement (EIS) For Water Reservations Applications in the Yellowstone River Basin. The Draft EIS, distributed in December 1976, is considered to be part of the Final EIS, as it contains essential information referenced in the Final Statement.

The Final EIS contains a summary of the Draft EIS, revised to reflect additional information made available to DNRC through further study and public participation in the review process. Also contained in the Final EIS are oral and written comments on the Draft EIS, coupled with responses to these comments by DNRC and some water reservation applicants.

Comments on the Final EIS will be accepted until March 2, 1977, allowing 30 days for review from the date of transmittal to the Governor and the Environmental Quality Council (EQC). The Board of Natural Resources and Conservation will not take action on the water reservation applications prior to expiration of the comment period.

This Final EIS was prepared in compliance with the Montana Environmental Policy Act, Section 69-6504(b)(3), R.C.M. 1947, and was transmitted to the Governor and the EQC on January 31, 1977.

Sincerely,

Wayne A. Wetzel
Environmental Coordinator

FINAL
ENVIRONMENTAL IMPACT STATEMENT
FOR
WATER RESERVATION APPLICATIONS
IN THE
YELLOWSTONE RIVER BASIN

February 1977

MONTANA DEPARTMENT OF NATURAL RESOURCES
AND CONSERVATION
Water Resources Division
32 S. Ewing
Helena, Montana 59601

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INTRODUCTION

The Department of Natural Resources and Conservation (DNRC) Final Environmental Impact Statement (EIS) for Water Reservation Applications in the Yellowstone River Basin contains a revised summary of the Draft EIS, comments received during the review period for the Draft EIS, DNRC responses to those comments, and the applicants' responses to the comments.

The public review and comment period for the Draft EIS extended from December 13, 1976, until January 12, 1977. During this period, four well-attended public hearings were held, one each in Glendive, Miles City, Billings, and Livingston, for the purpose of providing a convenient forum for public input to the review and comment process. Also, some 27 separate written comments were received during the Draft EIS review period, many of which expressed an opinion regarding water reservations, others of which commented specifically on the Draft EIS. A review and evaluation of the written and oral comments revealed that the major conclusions presented in the Draft EIS needed no substantive change. Therefore, the Draft EIS may be considered to be a part of the Final EIS. However, the commentators presented much additional information and pointed out several minor errors, as noted in the Comment Section. Therefore, many explanatory and clarifying responses to these comments were necessary by DNRC.

The EIS contains no recommendations from DNRC to the Board of Natural Resources and Conservation (Board) regarding action on the water reservation applications. Before the Board can act on the water reservation applications, hearings, required by the Montana Water Use Act, will be held at Glendive, Miles City, Billings, and Livingston. At the conclusion of these hearings, all parties to the reservation process (applicants and objectors) will be given the opportunity to submit findings of fact, conclusions of law, and a proposed order to the Board for consideration. DNRC recommendations to the Board will take this form. The Board, after receipt of this information from all parties, will close the record and, based upon that record, will decide the fate of the reservation applications.

PART I
REVISED SUMMARY -- DRAFT EIS

LEGAL BASIS FOR WATER RESERVATIONS

MONTANA WATER USE ACT

Under the 1973 Montana Water Use Act (Section 89-865 et seq. R.C.M. 1947), state and federal agencies, as well as political subdivisions of the state, may apply to the Board of Natural Resources and Conservation (called the "Board" throughout this Environmental Impact Statement) to reserve water for existing or future beneficial uses, or to maintain a minimum flow, level or quality of water. Before an order reserving water may be adopted, the applicant must establish to the Board's satisfaction:

- 1) the purpose of the reservation
- 2) the need for the reservation
- 3) the amount of water necessary for the purpose of the reservation
- 4) that the reservation is in the public interest.

A water reservation, when adopted, becomes a water right. However, if the Board later determined that the objectives of the reservation are not being met, it can then modify that water right. In addition, if the use of the reserved water requires diversion or storage, progress must be shown, over time, towards completion of those facilities. Such progress is to follow a previously submitted plan.

YELLOWSTONE MORATORIUM

Under the Montana Water Use Act, new water rights are established through the issuance of permits by the Department of Natural Resources and Conservation (DNRC). However, the Yellowstone Moratorium (Section 89-8-103 et seq. R.C.M. 1947), enacted in 1974, suspended all large applications (diversions of over 20 cfs or storage of over 14,000 af) for water use permits in the Yellowstone Basin until March 10, 1977. In addition, the Moratorium excluded reservations in the basin by federal agencies for three years.

Seven applications, all of which are primarily for industrial water use, were suspended. The language of the Moratorium emphasized the need for reserving water in the Yellowstone Basin for the protection of existing and future beneficial water uses; particular emphasis was given to the reservation of water for agricultural and municipal needs, as well as guaranteed minimum flows for the protection of existing rights and aquatic life.

By law, water use permit applications now pending will begin to be processed by DNRC on March 11, 1977. The priority date of any new water right subsequently approved will reflect the original date of application. However, any

water reservation approved by the Board prior to the approval of these permits will have a preference of use over the permits.

WATER RESERVATION REQUESTS

Thirty reservation requests have been received for waters of the Yellowstone Basin.

Water for future irrigation consumption was requested by 13 conservation districts, two irrigation districts, and the Department of State Lands (three applications); water for domestic or municipal consumption was requested by eight municipalities. Some uses under multipurpose requests by DNRC in applications on the Tongue and Powder rivers would also be consumptive. The levels of consumptive use requested would involve the total diversion of 391,500 af/y for municipal/domestic; 1,600,000 af/y for multipurpose (DNRC requests); and 986,900 af/y for irrigation. (Approximately 29,000 acres, a relatively small portion of the whole, have been duplicated among applications from different irrigation applicants).

Non-consumptive, i.e. instream flow, uses are requested in two major applications submitted by the Montana Fish and Game Commission and the Department of Health and Environmental Sciences. In addition, instream flows are requested in all the conservation district applications, although a specific figure was given only by North Custer Conservation District.

The applications are listed in Table 1.

SIGNIFICANCE OF WATER RESERVATIONS

The significance of water reservations cannot be overestimated; their impacts will be felt long after the decisions are made.

Because of the magnitude of the water reservation requests, the wide variety and magnitude of potential water uses, and their basinwide scope, action on these applications could establish future patterns of water use in the Yellowstone Basin.

By affecting both water availability and relative cost, the reservations may determine comparative future roles of irrigated agriculture and energy development. This, in turn, could profoundly affect the economy and future growth of the area. The relationship of consumptive uses to such beneficial instream uses as maintenance of aquatic habitats and water quality could also be defined.

The 1967 Legislature Assembly directed that a state water plan be developed for Montana to guide future water use. That water plan, not yet completed for the Yellowstone Basin, is scheduled to be finished by mid-1978. However, many of the options available under the water plan may be accomplished or foreclosed through the decisions on reservation requests. Hence, the Board's action may, at least in part, constitute the framework of the state water plan.

TABLE 1
 APPLICATIONS FOR RESERVATIONS OF WATER IN YELLOWSTONE BASIN

Applicant	Source	Amount	Use
Park Conservation District	Yellowstone & Shields River	752.6 cfs/108,143 acre feet per year (af/y)	Irrigation (36,570 acres)
Sweet Grass Conservation District	Yellowstone River, Boulder River & various tributaries	438.7 cfs/55,822 af/y	Irrigation (18,510 acres)
Stillwater Conservation District	Yellowstone River & Stillwater River	122.1 cfs/16,755 af/y	Irrigation (5,290 acres)
Carbon Conservation District	Yellowstone River, Clarks Fork, Rock Creek, Red Lodge Creek	274.2 cfs/47,557 af/y	Irrigation (21,015 acres)
Yellowstone Conservation District	Yellowstone River	378.2 cfs/62,900 af/y	Irrigation (26,785 acres)
Big Horn Conservation District	Big Horn River, Tongue River	151 cfs/21,200 af/y	Irrigation (9,645 acres)
Treasure Conservation District	Yellowstone & Big Horn Rivers, Sarpy & Tullock Creeks	129 cfs/19,978 af/y	Irrigation (7,645 acres)
Rosebud Conservation District	Yellowstone, Tongue Rivers, Armell's & Rosebud Creeks	585 cfs/94,129 af/y	Irrigation (37,360 acres)
North Custer Conservation District	Yellowstone River, Tongue River & Powder River	732.4 cfs/104,237 af/y	Irrigation (36,965 acres)
Powder River Conservation District	Powder River, Tongue River, & various tributaries	583.2 cfs/83,060 af/y	Irrigation (30,245 acres)
Prairie County Conservation District	Yellowstone River	512.9 cfs/63,127 af/y	Irrigation (20,646 acres)
Dawson County Conservation District	Yellowstone River	325 cfs/45,149 af/y	Irrigation (17,897 acres)
Richland County Conservation District	Yellowstone River	354.2 cfs/45,620 af/y	Irrigation (21,710 acres)

TABLE 1 continued

Applicant	Source	Amount	Use
Huntley Project Irrigation District	Yellowstone River	92 cfs/27,372 af/y	Irrigation (4,000 acres)
Buffalo Rapids Irrigation Project	Yellowstone River	167 cfs/124,434 af/y	Irrigation (41,306 acres)
Department of State Lands	Numerous tributaries in Yellowstone Basin	15,078 af/y	Irrigation (10,270 acres)
Department of State Lands	Numerous tributaries in Yellowstone Basin	143.64 cfs/21,429 af/y	Irrigation (7,143 acres)
Department of State Lands	Numerous tributaries in Yellowstone Basin	218.03 cfs/30,898 af/y	Irrigation (10,376 acres)
City of Livingston	Yellowstone River	20.8 cfs/15,060 acre feet per year (af/y)	Domestic, Municipal
City of Big Timber	Yellowstone River	6.19 cfs/4,483 af/y	Domestic, Municipal
City of Columbus	Yellowstone River	3.6 cfs/2,606 af/y	Domestic, Municipal
City of Laurel	Yellowstone River	23.2 cfs/16,830 af/y	Domestic, Municipal
City of Billings	Yellowstone River	1,190 cfs/317,456 af/y	All Beneficial Uses
City of Miles City	Yellowstone River	30 cfs/21,720 af/y	Municipal
Town of Broadus	Ground Water	0.84 cfs/605 af/y	Municipal
City of Glendive	Yellowstone	17.62 cfs/12,756.9 af/y	Domestic, Municipal
Department of Natural Resources and Conservation	Tongue River	450,000 acre-feet (af)	Irrigation, Industrial, Fish & Wildlife
Department of Natural Resources and Conservation	Powder River & tributaries	1,150,000 af	Irrigation, Industrial, Fish & Wildlife
Montana Fish and Game Commission	Yellowstone Basin and numerous tributaries	Variable monthly flows; 8,206,723 af/y for Yellowstone River at Sidney	Water Quality, Fish & Wildlife, Recreation
Department of Health and Environmental Sciences	Yellowstone River	6,643,000 af/y for Yellowstone River at Sidney	Water Quality

These are some of the major questions to be dealt with by the Board;

- 1) How should the water be shared between consumptive and instream users?
- 2) Should preference be given to some uses over others, by approving different priority dates for each use?
- 3) For how long should water be reserved? To the year 2000? Beyond?
- 4) Should some flow be left unreserved?
- 5) Should the amount of the instream flow reservations be variable-- based on the runoff available each year?

Because of the relatively scarce water supply and the high projected demands, the Tongue and Powder river basins will be the primary focus of water resource allocation in the Yellowstone Basin. Plans are under consideration by private, state, and federal entities for providing storage facilities; potential exists for joint projects with the state of Wyoming as well.

It appears that water quality and high costs could be significant constraints on the type of development that occurs in these two subbasins. In the event that Tongue and Powder storage is impractical for economic, environmental, or institutional reasons, other alternatives could be considered -- for example the use of Yellowstone mainstem water through offstream storage and aqueducts.

EXISTING WATER RIGHT APPLICATIONS

There is not enough water physically in the basin to satisfy all water reservation requests that have been filed. In addition, due to legal difficulties, it is not presently known exactly how much unappropriated water is available.

At present, rights to the use of certain water in the Yellowstone Basin legally belong to established entities, and that water may not be available to other users.

First, there are existing water rights of individuals. Because of a lack of documentation concerning historical and existing water use, procedures for the determination and adjudication of these existing water rights can not be quantified until the adjudication process is complete, several years hence.

Second, there is water that originates on, passes through, or adjacent to Indian lands. It is claimed that water was impliedly reserved with historically reserved lands for Indian use. However, the actual amount of water is in dispute, and will be settled in court. Similarly, water rights reserved with certain federal lands have not yet been quantified. Further litigation is pending on all the above rights.

Finally, the state governments of Montana, Wyoming, and North Dakota entered into an agreement in 1950 allocating Yellowstone Basin water. This agreement, known as the Yellowstone Compact, expressed the amounts of water as percentages of the total flows. Unfortunately, several assumptions must be agreed to by all parties involved before these percentages can be applied.

All existing water rights, whether quantified or not, are protected under the law. However, several of the water reservations, if fully granted, might adversely affect existing rights. Implementation of conservation district applications in the Shields River and Sweet Grass Creek, for example, would have to be carefully monitored to ensure that prior rights were protected. Adjudication of these streams, under the 1973 Water Use Act, would have to be completed, and water commissioners appointed by the court, before complete protection of those rights could be assured.

One purpose of the Water Use Act hearings is to solicit information regarding the effect of water reservations on existing water rights. However, it is beyond the scope of this document to examine those effects in detail.

THE IMPACT STATEMENT

In many ways this document is unique, partly because the water reservation process itself is unique. Both the Board and DNRC are presented with the possibility of an entirely new kind of action, affecting or preserving Montana's resources and environment in ways not possible in the past.

Whenever a proposed action is major and may significantly affect the quality of the human environment, or is controversial, the Montana Environmental Policy Act (MEPA), guidelines adopted by the Montana Environmental Quality Council, and rules adopted by both the Board and DNRC require preparation of an environmental impact statement (EIS). The purpose of the EIS is to examine the potential consequences of the proposed action, present alternatives, inform the public and guide the Board in its deliberations.

Certain individual water reservations, as proposed, will result in significant environmental impacts. In addition, allocating Yellowstone Basin water through a combination of these reservations would have basin-wide, cumulative effects which must be identified. Consequently, this EIS examines not only the anticipated impacts of each proposed reservation, but also the generalized regional impacts that could occur through approval of such a combination.

Because thirty applications are involved, and because each may be granted, modified, or denied, the number of these possible combinations is extraordinary. Action on any one proposal will limit possible actions on at least some of the others. The interrelationships are highly complex, and the impacts will be cumulative. Therefore, unlike most EIS's prepared by DNRC in the past, this document is more programmatic in nature than a detailed analysis limited to a specific project.

The scale of possible consequences represented by the requests is imposing. The extent and variation of land areas involved, the quantities of water requested, the number of streams and tributaries potentially affected, and the time periods involved make analysis very complex. In addition, most of the applications present general proposals for the future, and specific project data are not available. In some cases, preparation of a more detailed impact statement, specific to that single project, may be required, before water is withdrawn or impounded.

Much of the analytic data presented was made possible through an Old West Regional Commission grant to DNRC for the Yellowstone Impact Study, an investigation into impacts of water withdrawals from the middle and lower Yellowstone Basin. The Departments of Fish and Game and Health and Environmental Sciences also contributed to the Yellowstone Impact Study, as well as to the preparation and review of the Draft EIS.

SUMMARY -- EXISTING ENVIRONMENT

This section summarizes the existing natural and cultural environments in Montana's portion of the Yellowstone Basin. From alpine crags to semiarid plains, the basin exhibits a wide variety of land, vegetation, climate, wildlife, and water resources.

The Yellowstone River is unique among the nation's major rivers. Two tributaries, the Tongue and Bighorn rivers, are regulated; but the Yellowstone mainstem is virtually unimpounded for its entire 670-mile length. Headwaters of the basin are in the high mountains of southcentral Montana and northwestern Wyoming. Winter accumulation and summer melting of this variable snowpack give the Yellowstone River its basic characteristics of high spring runoff and low flows through the fall and winter.

Streamflow records, adjusted to reflect the 1970 level of development, show that the average annual runoff from the Yellowstone Basin is 8.8 million acre-feet (mmaf). Most of this water originates in the Yellowstone mainstem and the Bighorn River. The maximum and minimum recorded annual outflows of the Yellowstone Basin were 15.4 and 4.2 mmaf, respectively.

The major use of water in the basin (including Wyoming's portion) is irrigation, which consumes up to 3.5 million acre-feet per year. Amounts consumed in municipal and industrial uses are comparatively much smaller.

A major instream use of Yellowstone water is recreation. Because of the region's sparse population and somewhat limited access to the river, the actual use is much less than the potential.

With only a few impoundments and variability in seasonal and yearly flow, water availability is a problem in some parts of the basin--especially in the Tongue and Powder rivers, both lower basin tributaries.

The basin's water quality is generally good, especially in the upper basin. In the lower basin, water quality is altered by increases in temperature, total dissolved solids, and turbidity.

The Yellowstone mainstem has a predominately braided channel. This channel form, with its islands, bars, and backwaters, sustains many terrestrial and aquatic wildlife species. In its headwaters, the Yellowstone is a nationally renowned trout stream. In the lower part of the basin, the system sustains a productive warm-water fishery. A more extensive discussion of these fisheries is included in the aquatic wildlife section of Part I of the Draft EIS.

The region's economy is basically agricultural, although coal mining and conversion are rapidly increasing in importance. Montana leads the nation in strippable coal reserves with over 50 billion tons. In recent years, interest in this coal has highlighted the importance of water to energy production.

SUMMARY -- METHODOLOGY FOR EVALUATION OF IMPACTS

Because of the vastness and diversity of the basin, analysis and planning were done on the basis of the nine hydrologic subbasins.

The hydrology of each planning subbasin was analyzed by computer, taking into account such natural and human influences as precipitation, wind, snow-melt, evapotranspiration, ground-water storage, and irrigation. The computer model was used to predict monthly subbasin outflows for conditions that could occur in connection with water reservations. In addition, the model has been modified to include calculations for predicting concentrations of total dissolved (TDS).

Monthly subbasin outflows and TDS concentrations predicted by the model provided the basis for assessing environmental impacts, which are considered to be either "primary" or "secondary." Primary impacts are those on the river system itself, considering such features as monthly streamflows, water quality, channel form, and aquatic and riparian wildlife habitats. Secondary impacts, which are not necessarily of lesser importance, are the effects associated with the use of water.

SUMMARY -- WATER RESERVATION APPLICATIONS AND ASSOCIATED IMPACTS

The applications for Yellowstone water reservations, discussed in detail individually in Part III of the Draft EIS, may be grouped as either consumptive or instream.

Because there is not enough water, physically or legally, in the Yellowstone River and its tributaries to fully satisfy all water reservation applicants, conflicts arise between uses. Although the amounts of water involved in the legal commitments have not yet been quantified, it is probable that neither of the two large requests for instream flows can be satisfied without modification. However, most consumptive applications could be. Therefore, the major water availability conflicts are between instream and consumptive use applicants.

CONSUMPTIVE USE APPLICATIONS

IRRIGATION RESERVATION REQUESTS

Conservation Districts

Each of the conservation districts shown in Table 1 has applied for reservation of water for irrigation. The 13 applications are for a total diversion of 757,700 af/y to irrigate 290,000 acres.

Projects identified in the conservation district requests are not necessarily firm commitments for future development. In most cases individual landowners are not even aware that their lands are included. Each conservation district application is based on a reconnaissance soil survey, which involves a general evaluation of land features for preliminary planning of irrigation development. As such, each survey's applicability should be restricted to a determination of the general extent, location, and quality of irrigable areas.

Farm budget analysis was used by the applicants to determine economic feasibility of conservation district projects. These budgets compute the costs and returns associated with crop production and generalized farm costs, including investment, maintenance, and repairs. According to data submitted in the applications, benefits exceed costs in all cases.

Economic benefits, in the form of increased profits, would accrue to those engaged in irrigation development (the applications foresee \$18,775,000 in increased annual profits if all projects were completed). Although it would be spread over a number of years, there would also be secondary income and employment benefits resulting from the installation of new irrigation systems.

Environmental impacts considered in detail in Part III of the Draft EIS are those that would result from the granting of each application alone, without considering the effects of granting more than one application. If a combination of requests was granted, cumulative impacts would occur. Effects of these cumulative development levels are discussed in detail in Part IV of the Draft EIS, "Alternatives and Associated Impacts."

Most of the conservation district applications, if each were implemented alone, would have only minor impacts on the environment. No immediate physical impacts would result, and the minor impacts of each taken alone would occur gradually as the reserved water was put to use over a period of years. Similar impacts might occur if each application were denied, because irrigation could still be developed under water use permits.

However, there are exceptions. In the upper part of the basin, the applications would call not only for storage, but result in dewatering in a few small streams. The loss of these to migratory (spawning) and resident fish would have an adverse effect on the upper basin fishery. The Shields River and Sweet Grass Creek could be seriously dewatered. Other exceptions are in

the Tongue and Powder rivers, where further significant water development would require additional storage. In the Tongue River, the productive fishery would be adversely affected by stream dewatering and degradation of water quality.

Irrigation Districts

The applications of Huntley Project and Buffalo Rapids irrigation districts, shown in Table 1, request water from the Yellowstone mainstem. Neither application by itself would significantly affect the river system.

Montana Department of State Lands

In the process of identifying lands that should be included in requests, the conservation districts found that state and federal lands were intermingled with their potential projects. These lands were subsequently excluded from the applications, and the Department of State Lands has applied for a reservation for future irrigation of most of the state land involved.

The applicant's farm budget analysis, used for estimating the economic feasibility of this irrigation, found the projects to be feasible. The three requests ask for water from the Yellowstone mainstem and many tributaries. Most of the applications, if implemented alone, would have little effect on the flows of the larger streams. However, storage may be required on the Shields, Powder and Tongue rivers as well as many smaller streams to avoid late-season supply and water quality problems.

MUNICIPAL RESERVATION REQUESTS

With the exception of Billings, the amounts requested by municipalities are very small compared to the flow of the Yellowstone River. The Billings request totals 317,456 af/y, with a peak demand of 1,190 cfs. No population projections were given in the application, but the requested quantity could serve a city of about 1,500,000. During January, the request would equal about 37 percent of the 90th-percentile low flow and 18 percent of the median flow. Although half or more of the requested water would probably be returned to the river, making the flow reductions less serious, much of the returned water is likely to be treated wastewater, which, even if dependably treated by a secondary treatment plant, would adversely affect the river.

MULTIPURPOSE RESERVATION REQUESTS

DNRC has filed two applications for the reservation of water for future storage projects. These would involve storage of 450,000 af on the Tongue River and 1,150,000 af on the Powder River. Construction of the High Tongue Dam (with a firm annual yield of 112,000 af) on the Tongue River and Moorhead Dam (with a firm annual yield of 124,000 af, 75,000 of which is assumed for use in Montana) on the Powder River would be required in order to provide those amounts of storage. In effect, these applications request all unused and unappropriated water in these subbasins upstream of the dam sites.

The water reserved for these multipurpose projects would be for all legally defined beneficial uses. Specifics are not stated because detailed engineering and economic studies are necessary to determine the combination of uses that would maximize benefits.

The impacts of granting these applications would be similar to those discussed in detail in Part IV of the Draft EIS under the No Action Alternatives for the Tongue and Powder subbasins. Industrial use would probably receive the largest allocation, partly because irrigation interests alone may not be able to repay the costs.

The Moorhead Reservoir would have both beneficial and adverse effects. The Powder's fishery, predominately migrant, could change to a resident warm-water type. On the other hand, the reservoir and associated depletions would cause major increases in the total dissolved solids of an already saline river, adversely affecting irrigated agriculture and fish and wildlife. The extent of these effects would depend on the operation of the reservoir with respect to the maintenance of instream flows. Downstream from the reservoir, the river channel would tend to change from a braided stream with shifting bars to a single channel, as a result of downcutting.

An alternative to Moorhead Dam would be one or more offstream reservoirs for the diversion and storage of spring flows.

In the Tongue River, the channel has already undergone downcutting due to the existing Tongue River Dam. The impacts of High Tongue Dam and extensive depletions would depend on the levels of instream flows. Dewatering would adversely affect the diverse and productive fishery.

INSTREAM FLOW APPLICATIONS

FISH AND GAME COMMISSION

The Commission requested instream flows to protect fish and wildlife, water quality, and recreation values on the Yellowstone and all of the major tributaries, as well as many smaller tributaries. Culminating in a request of 8.2 mm³/y at Sidney, sizable portions of the average monthly flows were also requested in the four major interstate tributaries.

Requests for many of the smaller streams listed has no specific quantities attached. Generally, the unquantified applications were for the instantaneous flows during late summer, fall, and winter months and the dominant discharge for a brief period during spring months. Instantaneous flows year round were also requested on four spring creeks in the Upper Yellowstone Subbasin.

If this overall request were approved, large benefits would accrue to water quality, fish and wildlife, and recreation values. Although very difficult to quantify in dollars, these benefits also have substantial economic value.

The Yellowstone River and its tributaries presently support a diverse population of fish and wildlife in a nearly natural environment, representing a biologic evolution that cannot be reproduced by man. If future appropriations consume water without regard to the minimum needs of fish and wildlife, these populations will be deprived of habitat requirements.

Minimum instream flows have a cumulative benefit because water retained in a channel serves a variety of uses, such as recreation, fish and wildlife habitat, water quality, aesthetics, effectiveness of diversion structures, and downstream water rights. The value of instream flows must be considered as the sum of all instream benefits, whereas diverted water usually fulfills a single purpose.

Because the major consumptive user in the Yellowstone Basin is agriculture, the costs of instream flows would be the profits foregone by the irrigators denied water to expand because of those reservations. These costs vary with the magnitude of streamflows. When runoff is high, there may be enough water to satisfy both instream flows and agriculture, but when runoff is low more water must remain in the stream, and losses to agriculture would be greater. If it is assumed that instream flow guarantees are the only constraints to irrigation expansion and the full instream requests were implemented, then potential losses to irrigators have been estimated at \$7,700,000 for the year 2000. Due to the various factors, this estimate should be considered quite tentative.

If the Fish and Game Commission request was granted in full, energy interests would probably have to meet the expense of building storage facilities or developing ground water for use in low streamflow periods. However, many industrial water permit applications have indicated the willingness of energy-related companies to invest in water storage, diversion, and conveyance facilities.

MONTANA DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES

The purpose of this application, for an instream flow of 6,643,000 af/y in the Yellowstone at Sidney, is to prevent significant degradation and assure Montana water quality standards.

For water quality purposes, the majority of the river's reach considered in this application is classed B-D₃. In the request's justification, it is asserted that, by virtue of the B-D₃ water quality classification of the Yellowstone, the water cannot legally be allowed to exceed recommended limits for dissolved solids and sulfates. Thus, any flow level below the amount necessary to maintain established limits would be prohibited by law. Based on these criteria, the requested flows were determined by various methodologies included in the application.

This request, if implemented, would maintain existing water quality in the Yellowstone River downstream of Laurel. This request would benefit existing irrigators as well as other users.

Costs of this reservation, if implemented, would be similar to those of the Fish and Game Commission request.

SUMMARY -- ALTERNATIVES AND ASSOCIATED IMPACTS

The alternatives, chosen to represent a range of options, are based on the four major uses to which the water would be put: irrigation, municipal, energy conversion, and instream flows. In addition, a "no-action" situation is considered. Specific impacts in each subbasin are discussed at length in Part IV of the Draft EIS. However, only very generalized impacts are summarized here.

THE NO ACTION ALTERNATIVE

The No Action Alternative, which would occur if reservations were either denied or not acted upon, attempts to answer the question: "What will happen without water reservations in the Yellowstone Basin?"

ASSUMPTIONS

Diversion Uses

Irrigated agriculture would probably continue to expand and the availability of a dependable water supply would have to be determined on a project-by-project basis. Since a secure water supply would not be reserved, it is expected that an intermediate level of irrigation development would occur, along with a high level of energy development.

Table 2 shows the depletions, by subbasin, for various levels of energy development. The levels of irrigation development are shown on page 18. Table 3 shows the consumptive water use requirements for the No Action Alternative, based on the needs for the levels of development assumed

Instream Uses

Under the No Action Alternative, no special provision is made for instream flows, with two exceptions.

In the Upper Yellowstone Subbasin, instream flows would presumably be protected by the Department of Fish and Game filing on the Yellowstone mainstem from Gardiner to the north-south Carbon-Stillwater county line. In the Tongue Subbasin, very minimum flows were assumed (by operation of the proposed High Tongue Dam), because of the especially diverse and productive fishery. However, no legal obligation currently exists for this protection.

TABLE 2

THE INCREASE IN WATER DEPLETION FOR ENERGY BY THE YEAR 2000
BY SUBBASIN (af/y)

Subbasin*	INCREASE IN DEPLETION (af/y)						Total
	Elec. Generation	Gasifi- cation	Syn- crude	Ferti- lizer	Export	Strip Mining	
LOW LEVEL OF DEVELOPMENT							
Bighorn	0	0	0	0	0	860	860
Mid-Yellowstone	22,500	9,000	0	0	0	3,680	35,180
Tongue	7,500	0	0	0	0	3,950	11,450
Powder	0	0	0	0	0	860	860
Lower Yellowstone	0	0	0	0	0	0	0
Total	30,000	9,000				9,350	48,350
INTERMEDIATE LEVEL OF DEVELOPMENT							
Bighorn	0	0	0	0	4,420	1,470	5,890
Mid-Yellowstone	45,000	9,000	0	0	15,380	6,110	75,490
Tongue	30,000	0	0	0	9,900	7,000	46,900
Powder	15,000	0	0	0	2,210	1,670	18,880
Lower Yellowstone	0	0	0	0	0	0	0
Total	90,000	9,000			31,910	16,250	147,160
HIGH LEVEL OF DEVELOPMENT							
Bighorn	15,000	0	0	0	11,100	2,050	28,150
Mid-Yellowstone	45,000	18,000	29,000	0	38,700	8,710	139,410
Tongue	45,000	9,000	29,000	0	24,860	10,170	118,030
Powder	15,000	0	0	0	5,550	2,050	22,600
Lower Yellowstone	0	0	0	13,000	0	0	13,000
Total	120,000	27,000	58,000	13,000	74,660	22,980	321,190

* The four subbasins not shown (Upper Yellowstone, Billings Area, Clarks Fork Yellowstone, and Kinsey Area) are not expected to experience water depletion associated with coal development.

TABLE 3
 THE INCREASE IN WATER DEPLETION
 FOR THE NO ACTION ALTERNATIVE
 IN THE YEAR 2000

Subbasin	Increase in Depletion, afy			
	Irrigation	Energy	Municipal	Total
Upper Yellowstone	50,780	0	0	50,780
Clarks Fork	2,880	0	0	2,880
Billings Area	25,880	0	3,900	29,780
Bighorn	17,380	28,150	480	46,010
Mid-Yellowstone	33,640	139,410	3,840	176,890
Tongue	29,260	118,030	780	148,070
Kinsey Area	6,320	0	0	6,320
Powder	100,280	22,600	1,140	124,020
Lower Yellowstone	50,200	13,000	480	63,680
TOTAL	316,620	321,190	10,620	648,430

IMPACTS

The No Action Alternative demands the diversion of 806,740 af/y and the consumption of 648,430 af/y of water throughout Montana's Yellowstone Basin.

Primary

Although this alternative would place heavy water demands on the system, the supply would generally be adequate. However, water availability problems would occur in the Tongue and Powder rivers and the lower Yellowstone mainstem.

Water quality would remain near its current high level in the upper basin. The natural degradation of the lower basin, particularly in the Tongue and Powder subbasins, would be amplified, however.

With the major exception of the Powder River, changes in channel morphology in most subbasins would not be noticeable. Some localized sedimentation and erosion would occur, but most could be mitigated. In many cases conversion or overgrazed rangelands or dry croplands to irrigated croplands would reduce erosion and sedimentation, by improving the vegetation cover.

Aquatic ecosystems would suffer varying impacts, ranging from minor on the upper basin mainstem to severe in the Tongue and Powder subbasins. Riparian ecosystems in general would also suffer, but to a lesser degree; in fact, increasing numbers of migratory waterfowl might be attracted to the new irrigated fields.

Secondary

Under this alternative, water would generally be available for consumptive uses, such as irrigation, municipal-domestic, and industrial. Much of the time water would also be available in most subbasins for instream uses, such as fish and wildlife habitat and recreation. However, in the lower Yellowstone, and especially in the Tongue, existing aquatic and riparian ecosystems would be degraded significantly. Accompanying this degradation would be a loss of recreation potential.

IRRIGATION-EMPHASIS ALTERNATIVE

In the Yellowstone Basin some 650,000 acres are now either fully or partially irrigated, consuming annually about 1.9 mmaf of water. Since 1971, irrigated agriculture in the Yellowstone Basin has been increasing, primarily through the expansion of sprinkler systems.

Agriculture, more than just an important economic activity in the Yellowstone Basin, molds the lifestyle of the region. To protect and expand agriculture, it may prove desirable to reserve a quantity of water for increased future irrigation. However, irrigation development does not depend exclusively on an adequate water supply. It also depends on the availability of irrigable lands, financial feasibility, markets, and other less quantifiable factors.

ASSUMPTIONS

DNRC's reconnaissance land classification survey identified 2.2 million acres of irrigable land in the basin; a subsequent economic feasibility evaluation reduced it to 237,000 acres.

To present a range of possible irrigation futures, considering the diversity of influences, three irrigation development levels and associated water demands were projected. The lowest includes one-third; the intermediate, two-thirds; and the highest, all of the 237,000 feasibly irrigable acreage. Table 4 shows the three levels in irrigated acreage, water diversions, and water depletions by the year 2000. To analyze the effects of these levels, the irrigation diversion rate was assumed to be three acre-feet per acre. One acre-foot would be returned, on a delayed basis, to the streams.

TABLE 4

THE INCREASE IN WATER DEPLETION FOR IRRIGATED AGRICULTURE BY 2000
BY SUBBASIN

Subbasin	Increase in acreage	Increase in diversion (af/y)	Increase in depletion (af/y)
Low level of development			
Total	79,170	237,510	158,340
Intermediate level of development			
Total	158,310	474,930	316,620
High level of development			
Upper Yellowstone	38,080	114,240	76,160
Clarks Fork	2,160	6,480	4,320
Billings area	19,410	58,230	38,820
Bighorn	13,040	39,120	26,080
Mid-Yellowstone	25,230	75,690	50,460
Tongue	21,950	65,850	43,900
Kinsey area	4,740	14,220	9,480
Powder	75,200	225,600	150,400
Lower Yellowstone	37,670	113,010	75,340
Total	237,480	712,440	474,960

The applications for irrigation water use taken together propose reserving irrigation water for 360,000 acres, more than the high level of irrigation development (237,480 acres) predicted here.

IMPACTS

Primary Impacts

Although there are some significant exceptions, the Yellowstone mainstem and its tributaries have an adequate water supply for the high projected level of future irrigation, with little or no impact on the environment.

The first exception is the mainstem from the Billings subbasin downstream. Under high irrigation it would, in about one year in ten, experience fall flows low enough to cause environmental stress. Other exceptions are in the Tongue and Powder river subbasins, where water supply problems would persist even if additional storage were provided.

The channel formation processes are not expected to be affected by the projected depletions in the mainstem and most tributaries. The Tongue River channel has already undergone change following construction of Tongue River Dam; further impoundment should have little effect. There would be major changes in the Powder River channel, if that stream were impounded.

A potential for water quality degradation exists in the middle and lower basin, becoming greater as the Yellowstone progresses downstream. For the high level of development, salinity would not be a problem in the upstream subbasins (including the Clarks Fork Yellowstone and Bighorn), because the streamflows would be adequate to dilute the saline return flows. In the downstream mainstem subbasins, however, high TDS concentrations would be an occasional problem.

In the Tongue and Powder subbasins, where salinity is already troublesome, any irrigation development beyond present levels will aggravate that problem. Depletion for irrigation, even at the low projected level, would result in significant water temperature increases.

The conversion of rangeland to cultivated, irrigated fields may tend to increase erosion and sedimentation, especially if soils are not carefully managed. However, erosion and sedimentation could be reduced due to improved vegetation cover on converted irrigated fields.

Any new cultivation in the basin could attract migratory waterfowl, and would probably increase the number of geese and ducks stopping to feed along the rivers. Decreased flow and degraded water quality would cause significant impacts to the aquatic ecosystems of the Tongue and Powder rivers, with major effects on the Tongue River fishery.

Secondary Impacts

Water availability would be a problem only on the Tongue and Powder rivers, where increased storage is the only way enough water could be made available to satisfy the depletion assumed in those basins. On the Powder, even with storage, only about half of the high irrigation development projection can be satisfied.

In the three lower mainstem subbasins (Mid-Yellowstone, Kinsey Area, and Lower Yellowstone), during some years TDS concentrations would be high enough during low-flow months at the high level of development to require careful application of water to avoid salt accumulation in the root zone.

ENERGY EMPHASIS ALTERNATIVE

It was concluded during the course of the impact study that an energy emphasis alternative would, for all practical purposes, be the same as that predicted under the No Action Alternative. Refer to those sections, here in the Summary and in Part IV of the Draft EIS, for discussions of the impacts.

INSTREAM FLOW EMPHASIS ALTERNATIVE

An Instream Flow Emphasis Alternative would, by precluding major depletions in the future, serve to preserve the basin's diverse and productive aquatic and riparian ecosystems.

Such an alternative, if chosen, would be very similar to the situation wherein the instream flow requests by the Montana Fish and Game Commission and the Department of Health and Environmental Sciences are granted. These impacts are largely addressed in the section discussing the Fish and Game application. It should be noted here, however, that the Department of Health's application asks for higher flows during the winter months than does the Fish and Game Commission's. If both applications were satisfied, then, water availability for other uses would be lower during the winter than anticipated by the Fish and Game Commission's request.

Not only would basin ecosystems be protected by this alternative, but water quality and levels would also be maintained. This would benefit current irrigators, although there may be a cost to future "irrigators" in terms of development opportunities foregone.

OTHER ALTERNATIVES

The basic concern of this EIS is alternative allocations of surface water of the Yellowstone Basin--waters which are often not available at the right place and the right time for prospective users. There are, however, a number of alternatives of this source of supply. Briefly considered are the following alternatives:

- 1) ground water;
- 2) dry cooling for energy conversion plants,
- 3) aqueducts and canals from other water sources, and
- 4) water conservation through management.

However, assessing the environmental, social, and economic impacts of these alternatives is beyond the scope of this EIS.

SUMMARY -- EFFECTS OF WATER RESERVATIONS ON PENDING WATER APPROPRIATIONS

The priority date of a water reservation is established at the time the Board approves the application. This reservation, which can be regarded as a water right, then has priority over rights with later priority dates, and is junior in status to water rights with earlier priority dates. As described earlier, however, this general rule is affected by granting a preferred use to reservations under the Yellowstone Moratorium. Water reservations adopted before approval of suspended permit applications will have preference of water use.

Montana, unlike most western states, has not had a preference system for water uses until this enactment of a partial preference system in the Yellowstone Moratorium

Approval of water reservations could therefore have significant and adverse effects on large industrial water right applications held pending by the moratorium. If all water reservation requests were adopted, industrial applicants on the Tongue and Powder rivers could not implement their applications. However, industrial applicants for Yellowstone River water could still obtain a firm supply of water through offstream storage, with the possible exception of full approval of the instream flow requests.

It should also be noted that commitments of water made through reservations would probably have the effect of discouraging speculative permit applications in the future, regardless of the specific beneficial use involved.

SUMMARY -- RELATIONSHIP BETWEEN
SHORT-TERM USE OF THE ENVIRONMENT
AND LONG-TERM PRODUCTIVITY

AGRICULTURAL PRODUCTIVITY

The granting of significant instream flow requests would severely limit the expansion of irrigation. The denial of all reservation requests would allow gradual continued increases in irrigation under water use permits; however, other users may move first to secure the use of unappropriated waters by permit. This is particularly true in basins where water shortages are apparent, where coal reserves are located, and/or where expensive storage facilities will be needed.

The highest benefit to agricultural productivity would result from granting all requests from conservation districts, irrigation districts, and the Montana Department of State Lands. Although other users could obtain the use of reserved water through temporary permits, the approval of such reservations would insure that sufficient water is available to allow the greatest possible eventual increase in irrigation. However, increased salinity, resulting from increased agricultural and industrial depletions, may decrease the per acre yields of crops.

Costs of providing water for irrigation would include investments in storage facilities and water delivery systems. Energy and labor costs would increase. Other opportunity costs would be incurred, through the reluctance of possible water users to invest in facilities dependent upon the temporary use of water reserved for another purpose.

WATER FOR MUNICIPAL USE

Communities with reserved water would gain the benefit of securing a future water supply. A municipal water reservation could reduce the future cost of

obtaining water, particularly if possible alternative sources (such as ground water) are expensive to develop and/or treat.

WATER FOR ENERGY AND OTHER INDUSTRIAL USES

If a water reservation is made for multiple purposes, or if all reservations are denied, water will be readily available for energy development. Energy conversion plants require large quantities of water, particularly if they do not use the more expensive dry cooling systems. In certain subbasins, notably the Powder and Tongue rivers, insufficient water is available to provide for high levels of both energy and irrigation development. Energy development would accrue economic and employment benefits to the areas involved, and would require the utilization of coal, a non-renewable fossil fuel.

Instream flow reservations, if they preclude direct industrial withdrawals, would require industry to choose alternative water sources which, if available, are likely to be more costly.

Energy development, especially if conversion plants are constructed, would have an impact on social and cultural systems as sparsely populated, agrarian areas become transformed into populated, industrial centers. Negative impacts to the natural environment, some of which may be extensive and long-term, would also result.

ENVIRONMENTAL QUALITY

Water remaining in the stream provides a public benefit by providing natural flow regimes to maintain amenity values like ecosystem productivity, water quality, wildlife habitat, and recreation.

The public benefits provided by waters of the Yellowstone Basin could become incrementally diminished by numerous individual appropriations. At present, instream flow reservations provide the only available mechanism to prevent further dewatering.

The difficulty in the case of instream flows is in trying to determine the optimal quantity of water to leave in the river, i.e., the marginal amount at which the public benefit begins to outweigh the private gain. If natural instream flows are allowed to diminish to this limit, environmental productivity will decrease as natural flow regimes are altered, water quality lessens, habitat is lost, biological diversity diminishes, and water temperatures increase.

SUMMARY -- IRREVERSIBLE AND IRRETRIEVABLE
COMMITMENTS OF RESOURCES

WATER

Unappropriated surface water is the primary resource being considered in this EIS. Instream flow reservations, if approved, would be implemented immediately. Most of the consumptive-use reservations, if approved, would be implemented over the next few years, as projects were built and water diverted.

Water reservations would be reviewed periodically, and can be modified or revoked if the Board determines that the purpose of the reservation is not being met. Furthermore, future water use plans or expectations may be withdrawn or changed voluntarily. In both respects, water reservation decisions cannot be considered absolutely irreversible and irretrievable.

LAND

Reservation requests could substantially influence irreversible commitment of the land resource. Water reserved for irrigation, for example, may help provide for the conversion of rangeland and dry cropland to irrigated cropland; water reserved for multiple uses, including energy, might be a factor in the conversion of agricultural land to such uses as mines, plant sites, roads, pipelines, and urban development.

Conversely, as the amount of water reserved for instream flows increases, the amount of land that can receive irrigation decreases. Similarly, the reservation of water for instream flows may inhibit energy-related development.

Any storage reservoirs would flood certain lands, thereby precluding other surface use options and possibly irreversibly committing mineral resources such as coal.

ENERGY AND MATERIALS

An irretrievable commitment of energy and materials could indirectly result from the granting of applications for other than instream flow purposes, or from the denying of reservation requests. Energy and materials are required in the construction and operation of either irrigation or energy facilities.

Water developed for energy will help commit Montana's coal reserves to extraction, an irreversible commitment of a non-renewable resource. The instream flow applications, on the other hand, might reduce the water available for energy development, slowing the growth rate, and extending the lifetime of the basin's coal reserves.

PART II

ERRATA

The Draft EIS contains the following errata. Additions, deletions, or changes are listed by page number (P.), paragraph number (par.) and line number (line).

VOLUME ONE

P. 1, last par., line 1. Should read: "By law, water use permit applications now pending"

P. 1, last par., line 2. Should read: ". . . on March 11, 1977."

P. 2, next to last par., line 4. Should read: "The relationship of consumptive uses to"

P. 3, Table 1, line 4. Change 752 to 752.6.

P. 9, par. 3, line 5. Should read: ". . . were 15.4 and 4.2 mmf"

P. 9, next to last par., line 5. Delete: ". . . of nonsalmonid species."

P. 12, par. 2, line 9. Should read: ". . . treated wastewater, which, even if"

P. 16, Table 2. Should read:

	Energy	Total
Powder	22,600	129,570
Total	321,190	648,430

P. 31, 41, 61, 83 and 237. Due to a printing error, all information for the Crow and Northern Cheyenne Indian Reservations has been blocked out in the following maps:

- Map I-1, p. 31. Also place "4" in Big Horn County.
- Map I-3, p. 41
- Map I-4, p. 47
- Map I-5, p. 61
- Map I-6, p. 83
- Map IV-1, p. 237

P. 47, Map I-4. Add a square, no. 2864, at Yellowtail Dam.

Change triangle, no. 3075, to a square on the Tongue River Reservoir.

P. 52, Table I-5. Should read: "Lake Wolvoord."

P. 53, Table I-6. The active storage for Willow Creek Reservoir is 23,000 af.

P. 58. par. 2, line 1. Should read: "The middle Yellowstone is an area"

- P. 71, par. 1, line 1. Delete the names "Mission" and "Eightmile."
- P. 71, par. 1. Delete the last sentence of this paragraph.
- P. 71, par. 5, line 2. Should read: "Yellowstone River above the Shields River (Newell 1976)."
- P. 76. par. 2, line 3 and 7. Should be "Rehwinkel".
- P. 79, par. 3, line 1. Should read: "Mule and white-tailed deer commonly range"
- P. 81, last par., line 4. Should read: ". . . during spring and fall migration."
- P. 83, Map I-6. Change: "Pigskins Basin Archaeologic District" to "Hoskins Basin Archaeologic District" and change: "Demijohn Flay Archaeologic Dist." to: "Demijohn Flat Archaeologic Dist."
- P. 105, Figure I-6. Multiply the numbers on the vertical scale by 10.
- P. 107, par. 4, line 2. Change 93,460 to 97,080.
- P. 116, last par., line 5. Should read: ". . . by necessary implication, to lands. . . ."
- P. 131, Table III-1, line 4. Change 752 to 752.6
- P. 181, Map III-5. Yellowtail Reservoir should not be shaded. Shading should start at the outlet of Yellowtail Reservoir and continue to the confluence of the Bighorn and Yellowstone rivers.
- Rosebud Creek should be shaded starting at Cottonwood Creek, T.4N, S.42E, R. 16S, and continuing to its confluence with the Yellowstone River.

VOLUME TWO

- P. 221, Part IV, Contents. The section on "Level of Energy Development" begins on page 226, and the title "No Action Alternative" should be underlined.
- P. 227. last par., line 1. Should read "See Appendix, page 403 ff., for data"

P. 230, Table IV-3, Should read:

	Export	Total
HIGH LEVEL OF DEVELOPMENT		
Powder	5,550	22,600
Total		321,190

P. 231, par. 6, line 3. Should read: ". . . on about one-half of all new"

P. 233, Table IV-5. Footnote a should read: ". . . explained on p. 232."

P. 236, Table IV-7, Should read,

	Upper Yellowstone
Sweet Grass	10,204
Stillwater	6,208

P. 241, Table IV-9, Should read

	Energy	Total
Powder	22,600	124,020
Total	321,190	648,430

P. 280, Figure IV-11. Title should read "Powder Subbasin Monthly Outflows for the Reduced (55%) High Irrigation Emphasis Alternative."

P. 302. Should follow page 297. Pages 298 to 301 should follow p. 302.

P. 305, par. 1, line 1. Should read "The Missouri River is already"

P. 375. Map A-4. Except for the Indian Reservations, the shading should be reversed.

Appendix, Maps A-2 through A-13. Wildlife habitat maps do not clearly define Indian reservations since the proper printing procedure was not used. Information is not available for the reservations, and shaded areas should stop at these boundaries.

Page 401, Table A-1. Source: Montana Fish and Game Commission, unpublished.

PART III
LIST OF COMMENTATORS

Oral Commentators

The following is a list of those who commented during the public hearings.

Glendive Hearing

Fran Mertes
Don Sprague
Lynn Haidle
Irvin Haidle
Kenny Nemitz
Dave Alberswerth
Sam Selman
Ethel Gentry
Henry Loble
John Redman
Alden Kimsey
Jerry Sir

Miles City Hearing

Glenn Rugg
Julian Terret
John Mobley
Herb Mobley
Ambrey Gartner
Larry Scanlon
J. W. Roberts
Barbara Archer
Gene Garber
Cecil Weeding
Robert Criswell
Hugo Muggli

Billings Hearing

Jim Thomas
Connie Keogh
Don Allen
Lon Lehman
Don Herndon
Harry Miller
Keith Williams
George Cook
Bob Swenson
Dale Fryer
John Mohr, Jr.

Livingston Hearing

Howard E. Harper
Helen Chriske
William H. Donald
Archibald H. Allen
Norm Starr
Allyn O'Hair
W. E. Harris
Franklin Grosfield
Mike Sierz
Tom Lano
Calvin R. Bohleen
Clarence Pile
Pete Story
Robert Burns
Hazel G. Peterson
Neil M. Travis
Gene Peterson
Leonard Sargent
Lorents Grosfield

Written Commentators

The following is a list of those who submitted written comments.

Yellowstone-Tongue APO
Billings Chamber of Commerce
Dave Stiller, NPRB EIS Team
Montana Department of Health and Environmental Sciences
Orval Ellison
Montana Water Development Association
Trout Unlimited
Pete Story
Bureau of Land Management
Montana Wildlife Federation
Northern Plains Resource Council
Treasure Conservation District
Rosebud Conservation District
Bud Lilly
Federation of Fly Fisherman
Francis J. Walcott
Utah International, Inc.
Montana Power Company
Montana Fish and Game Commission
Combined Conservation Districts
Alden Kimsey, Montana Department of Community Affairs
Intake Water Company
Jerry Sir
City of Livingston
Roy and Ethel Gentry
The American League of Anglers

PART IV
WRITTEN COMMENTS ON THE DRAFT EIS

Written comments on the Draft EIS received from the following individuals, agencies, and organizations are reproduced in this section. Summarized oral and written comments are coupled with DNRC responses in Part V.

Commentator	Page
Yellowstone-Tongue APO	41
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Montana Department of Health and Environmental Sciences	47
Orval Ellison	53
Montana Water Development Association	53
Trout Unlimited	55
Pete Story	56
Bureau of Land Management	57
Montana Wildlife Federation	58
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The American League of Anglers	120

WATER QUALITY MANAGEMENT PROJECT



CLARK, LEIDY, DENICO

DORELA HUNT, PHD

AMBER GUARDNER, EIT

YELLOWSTONE - TONGUE A.P.O.

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RECEIVED

DEC 27 1976

MONT. DEPT. OF NATURAL
RESOURCES & CONSERVATION

December 22, 1976

Environmental Coordinator
Dept. of Natural Resources & Conservation
32 S. Ewing
Helena, MT 59601

Dear Sir:

This letter is in response to the draft EIS recently issued for "Water Reservation Applications." General comments follow. Specific comments are attached. A formal statement will be prepared for the hearing in Miles City.

As Carter, Custer, Fallon, Powder River, Rosebud, and Treasure Counties and the Northern Cheyenne Indian Reservation have been designated by the Governor of Montana as being part of our Section 208 Water Quality Project, I feel that we must make a strong protest against any actions that will degrade the quality of the surface waters in the project area to such a degree that they are not suitable for existing uses. As you are aware, the maintenance of water quality suitable for existing uses may restrict some types of future development requiring a consumption use of water.

I would like to point out that the massive expansion of irrigation and/or industrial water use in the Yellowstone, Tongue and Powder River basins would cause water quality problems in violation of existing and proposed state regulations concerning water quality. The Water Quality Bureau has established that a TDS level of 500 mg/l should not be exceeded due to the fact that the rivers in the vicinity are classified as B-D's, which implies that the water shall be kept suitable for domestic use. The YTAPO has requested the Water Quality Bureau to add a quantitative criteria for irrigation related salinity to the B-D's classification. This would state that man induced salinity shall not cause the instream salinity to exceed 750 umhos. Water with a conductivity above this level is classified by the USDA (Handbook #60) as having high salinity for irrigation purposes. A check of the average conductivity/TDS ratio for the Tongue River at Miles City shows that the USDA 750 umho level is almost identical to the PHS 500 mg/l TDS level utilized by the Water Quality Bureau.

Environmental Coordinator, DNR&C.
December 22, 1976
Page 2

Even though natural salinity problems normally cause it to exceed the above limits, the Powder River is officially covered by the TDS/salinity limitations mentioned above. The YTAPO has recommended to the Water Quality Bureau that a new classification that reflects the natural water quality of the Powder River be established. But, there are certain legal problems involved with the downgrading of the classification of a river. Even if the classification of the Powder River is "downgraded", we would recommend that the maximum salinity level be set at 2,250 umhos (the USDA very high salinity level) or less. The projections in your EIS indicate that even for the low level of development, the TDS in the Powder River would exceed 3,400 mg/l ten months of the year during a 90% low flow. The 3,400 mg/l level converts to approximately 5,000 umhos, far in excess of the proposed upper limit of 2,250 and six times the present limit.

This brings us to the primary practical problem involved. An early court case, Helena vs Rogan (1902), confirmed that (quoting from MSU Bulletin 545) "The appropriator is entitled to have his right protected so that he may have water at his headgate in sufficient quantity and of such quality as to meet his needs as covered by his water right." The above water quality limits (750 umhos on the Tongue & Yellowstone and 2,250 on the Powder) are proposed with the intent of protecting the rights of existing irrigators. These limits would also benefit other existing uses of the rivers, including recreational uses.

Hopefully the lower salinity limit (750 umhos) on the Tongue and Yellowstone Rivers would allow the continuation of sprinkler irrigation in these drainages. Irrigation in the Powder River drainage (and some of the tributaries to the Tongue and Yellowstone Rivers) might be restricted to flood irrigation on the more permeable soils.

The YTAPO is also concerned with the possible affect of increased salinity levels on the fish and other aquatic life within the rivers included in the EIS. But, it appears that adequate quantitative data on the tolerances of aquatic organisms to various salinity (and specific ion) levels is not available. As a result, we have no current objections to the utilization of the data presented on page 56 of the EIS.

You may wish to note that the USDA Irrigation/salinity data that we have referenced is not identical with the data you present on page 55 of the EIS.

Sincerely,

Clark Judy

COMMENTS ON SPECIFIC PARTS OF THE DNR&C WATER
RESERVATION APPLICATION EIS

Comments on water reservation application EIS, cont.
December 22, 1976
p. 2

- pp. 11: It states that, "In the Tongue River, productive fishery would be adversely affected...." A specific goal our 2008 project is to assure, "...water quality which provides for the protection and propagation of fish...." The Lower Yellowstone drainage area has been specifically designated by the Governor of Montana as being an area where these goals should be met. (Designation of Carter, Fallon, Custer, Powder River, Rosebud, and Treasure Counties by Governor Judge in 1975.)
- pp. 13: The people reviewing the reservations should be aware that the YTAPO has asked the Water Quality Bureau to specify quantitative limitations on the salinity of water allowable under the B-D3 classification. Our request basically states that man induced salinity shall not cause the conductivity of the water to exceed 750 umho. This number was based on the data provided in the US Department of Agriculture Handbook No. 60. The 750 umho limitation is very close to the 500 mg/l TDS limitation for drinking water in the older Public Health standards.
- It should be noted that this limit should be maintained on the Tongue River as well as on the mainstem of the Yellowstone River.
- Currenty the B-D3 standards also apply to the Powder River and to the smaller streams in the vicinity. We have recommended that a new classification be developed for those streams that have natural salinity problems. But, the Water Quality Bureau currently has legal limitations which do not allow it to "downgrade" the existing classification of stream. As a result, theoretically, the water in the Powder, etc., would be under the above salinity limitations.
- pp. 15: Water quality may be a limiting factor under the "No Action" alternative. See Comment 45
- pp. 17: Irrigation of existing range and dry croplands might reduce erosion, but it would increase salinity problems.
- pp. 19: We would like to emphasize your comment concerning salinity problems and adverse impacts on the Tongue River fisheries. It should also be emphasized that there is no known water supply east of the Tongue and south of the Yellowstone Rivers that is not in the high or very high USDA salinity and/or sodium categories relative to use for irrigation.
- p. 21: The probability of increased salinity decreasing the per acre yields of crops should be included under "long term productivity." See Comment 46
- p. 46: The comments on soil and salinity should be emphasized.
- p. 55: The "Salinity Hazard for Irrigation Waters" data differs from that given in USDA Handbook No. 60 (1036 vs 250, 1480 vs 750, 3700 vs 2250; converting mg/l to umho, using the period of record average ratio of 1:1.48 for the Tongue at Miles City.) See Comment 47
- p. 59: If the conductivity of the Madison water is under 1,000 umho as some tests have indicated, it might be useable for irrigation. Its sodium content would be very low, but there might be some thermal problems. The USGS should have additional data by late spring (1977). See comment 56
- p. 80: White-tailed deer and turkeys are common along the Powder River.
- p. 82: Have heard of several reports of eagles nesting in Powder River County.
- p. 111: Might mention that it would be economically unreasonable to purchase grazing land in southeastern Montana at current prices with the intent to graze livestock (without extensive government leases) as the current value of the livestock raised would not even pay the interest on the loan.
- p. 117: Is there a possibility that the Indian water rights will have a quality as well as a quantity stipulation? See Comment 48
- p. 118: Based on average annual flow at the state line? See Comment 49
- p. 149: It should be noted that existing water supplies may not be suitable for long term sprinkler irrigation.
- p. 154: The statement, "Irrigation return flows will be saline but will be adequately diluted...", is questionable. It will be difficult to dilute saline water with water already in the USDA's medium or high salinity category. See Comment 50
- p. 154: Under "Secondary Impacts" -- long term decrease in per acre yields due to increased salinity. See Comment 46

Comments on water reservation application EIS, cont.
December 22, 1976
p. 3

pp. 161: Refer to prior comments. The 769 mg/l and 990 mg/l salinity levels would be excessive relative to the B-03 water quality requirements. Same comments apply to the lower portion of p. 161.

pp. 173: The Billings request seems excessive. The rationale for the requests should be investigated. and p. 3-8 of City of Billings response

pp. 174: Most of the municipal requests seem high relative to the anticipated population. See Comment 128

pp. 177: Should be an explanation of why the DNR&C is requesting approximately the maximum recorded yield on the Tongue and Powder Rivers instead volume that could be reasonably expected to be derived. Does the "firm yield" on the Powder of 124,000 include evaporative losses, existing uses, and maintenance of instream water quality? See Comment 52

pp. 193: The potential value of recreational activities forgone, costs of pumping from low flows, income lost due to decrease yields caused by increased salinity, etc., if instream flow is not maintained, should be presented to provide a fair comparison. (but, don't ask us to calculate them.) See Comment 42

pp. 208: The YTRAPD supports the Dept. of Health & Environmental Sciences request. The same rationale should be extended to all streams and rivers with a B-03 or better classification. But, there will be some problems due to natural salinity problems. See our comment on p. 13.

p. 233: Explain that, "Lands feasible to irrigate", does not mean that the water is available to irrigate them. See Comment 53

p. 240: Mention that water quality limitations may act as constraints on the "No Action" alternative. See Comment 53

p. 245: Violation of water quality standards.

p. 248: Impacts of channel stabilization -- increased useability of agricultural land, decreased wildlife habitat, etc.

p. 250: Violation of water quality standards.

pp-253 to 289: Comments similar to those above.

p. 281: Can you document that the watershed, not the bed and banks of the river are the primary source of the sediment being transported? Was the transport of coarser material be bedload considered? See Comment 54

Comments on water reservation application EIS, cont.
December 22, 1976
p. 4

p. 282: At a 90% flow duration level, under the simulated development, the conductivities will be near or in excess of 5,000 umho for eight months of the year. The USDA describes water with a conductivity above 2,250 as, "very high salinity water is not suitable for irrigation under ordinary conditions, but may be used occasionally under very special circumstances."

p. 283: Considering the projected salinity levels, why are the sport fisheries projected to improve, including trout? See EIS response, pp. 1-2.

Additional adverse impacts on wildlife due to long term deterioration of habitat after construction of dam--conversion of river bottoms to fields, reduction of young cottonwood growth, no new oxbow lakes, etc.

p. 284: If a mainstem reservoir would reduce sediment transport and cause the fisheries to improve, then the required instream flows might have to be increased to allow for the increased recreational use. Also, the relationship between fisheries and salinity mentioned above is not clear.

p. 286: This comment also applies to prior sections. Any man induced changes which would reduce the dissolved oxygen level to below 5 mg/l would be in violation of the standards for a B-03 classification.

p. 304: Include comment that the sodium level of most near-surface groundwater is too high for irrigation purposes. (The SAR is often around 40.)

p. 305: A Colorado study has indicated that seepage from unlined ditches is the primary cause of salinity problems in some areas.

Yellowstone - Tongue ARC

The overall objective of Montana's water quality laws, and those of the United States, is to ensure that beneficially useable water will be available to a wide spectrum of users. These include agriculture, industry, recreation, and fish and wildlife.

In response to the EIS for Water Rights Allocations prepared by the Department of Natural Resources and Conservation, the Yellowstone-Tongue APO would like to present the following comments: See Comment 55

In the determination of possible impacts resulting from granting water reservations for irrigation uses, careful attention should be focused on existing users as well as the Water Quality Standards established by the Department of Health and Environmental Sciences. An excessive amount of future development of irrigation would render water of unuseable quality for present downstream users. Not only is this a violation of these users' water rights, according to an early court case, *Helena vs Rogan* (1902), but a violation of the Montana Water Quality Standards which specifically classify the Tongue, Powder, and Lower Yellowstone Rivers as B₃ streams, which are to be maintained at a quality useable for agricultural purposes.

See Comment 60

The limits of salinity that determine useability for agricultural purposes have been proposed, by the VIAPQ, as 750 umhos on the Tongue and Yellowstone Rivers, and as 2,250 umhos on the Powder River with the intent of protecting the rights of existing irrigators. These limits are based on irrigation/salinity data presented in USDA Handbook No. 60.

The lower salinity limit on the Yellowstone and Tongue River should allow the continuation of sprinkler irrigation in these drainages. However, because of the already high salinities of the Powder River and some tributaries of the Tongue and Yellowstone, extreme caution should be taken in considering sprinkler irrigation in these basins.

Concerning storage on the Powder River at Moorhead, special attention should be given to the statement that even at the low level of irrigation development, the water of Powder River would be unacceptable for irrigation at least one year out of two, but, with careful water management, would allow for expansion of irrigation water use. This stresses the delicate balance existing between the present extent of irrigation and long-term productivity of irrigated lands in the Powder River drainage.



**BILLINGS
CHAMBER
OF COMMERCE**

December 28, 1976

John C. Orth
Director
Department of Natural Resources and Conservation
32 South Ewing
Helena, Montana
59601

Dear Mr. Orth:

The Billings Chamber of Commerce is extremely concerned about the future of agriculture in the Yellowstone River Basin. It is quite obvious that without water agriculture and the economy cannot expand and develop to their full potential. The needs of recreation are important, but the needs for jobs and food with an expanding population are paramount.

The Billings Chamber of Commerce feels that present requests for water reservations should be delayed until the state water plan is complete. Furthermore, future water decisions must take into consideration the needs of all segments of the economy and must make it possible for Montana to have access to water flowing through the state. As a state, we do not want to be in the situation of not being able to use the water at our front door because of downstream claims that supersede Montana's needs.

Water is vital to agriculture and agriculture is vital to the economy of Montana. It is our hope that economic growth will not be stifled by lack of water. Attached is a position statement from the Billings Chamber of Commerce.

Sincerely,

Jase O. Norsworthy
President



POSITION STATEMENT

DATE:

December 27, 1976

SUBJECT:

Conservation and Preservation of water in the Yellowstone River Basin

SUBMITTED BY:

Agriculture Committee

STATE OF POSITION:

Conservation and preservation of Montana's water is of the utmost importance for the future economic growth of the Yellowstone River Basin. Therefore, the Billings Chamber of Commerce is opposed to the "water reservation doctrine" as it is being used by public and state agencies.

BACKGROUND INFORMATION:

- a. The reservation requests of the Fish and Game Department, Department of Health and others will stop, inhibit, or make future Montana growth impossible.
- b. If the requested reservations are granted, downstream development would be encouraged at the expense of future economic growth in Montana.
- c. Montana agriculture needs an abundant water supply for future growth.
- d. The majority of water in the Yellowstone River Basin is presently used by agriculture.
- e. The average annual flow of the Yellowstone River at Sidney is 8.8 million acre feet per year.
- f. The Fish and Game Department has requested 8.2 million acre feet per year.
- g. The Department of Health has requested 6.6 million acre feet per year.

CONCLUSION:

Montana is in the process of developing a state water plan. Numerous costly studies have been initiated. It is not realistic to lay claim to the water until the state plan is complete.

* * * * *

Date Approved By The Board of Directors Dec. 27, 1976
Signature of The President of The Board 
Jade O. Norsworthy

M E M O R A N D U M

RECEIVED

DEC 28 1976

MONT. DEPT. OF NATURAL
RESOURCES & CONSERVATION

TO: Wayne Wetzel, DNRC
FROM: Dave Stiller, NPRB EIS Team *DMS*
DATE: December 27, 1976

RE: Review of and comment upon the Yellowstone River Basin Draft EIS (12/76).

My sole comment is that I feel the EIS places too much emphasis upon potential groundwater reserves in the Madison Group.

It appears the sources used to validate such a claim originated with the 1974 Northern Great Plains Resources Program. Although it has become fashionable since then to promote the Madison as a potential source of great importance, my own familiarity with the situation precludes my agreeing. More recent investigations (see references), as well as conversations with professionals within the U.S. Geological Survey, lead me to believe that at best it is still premature to assign any great degree of optimism to the future of deep aquifers in the Powder River Basin.

I believe the best interests of all concerned are not served by such optimism at this time. Further work is necessary before any substantially solid statements can be made.

See Comment 56

Accordingly, I suggest that you "play down" the importance of the Madison Group until such time as the data provide a basis for optimistic predictions.

References:

- Miller, W.R., 1976, "Water in Carbonate Rocks of the Madison Group in Southeastern Montana - A Preliminary Evaluation", USGS Water Supply Paper 2043, 51 P.
- Swenson, F.A., Miller, W.R., Hodson, W.G. and Visser, F.N., 1976, "Maps Showing Configuration and Thickness, and Potentiometric Surface and Water Quality in the Madison Group, Powder River Basin, Wyoming and Montana", USGS Map I-847-C.

DS:gs



Department of Health and Environmental Sciences
STATE OF MONTANA
Environmental Sciences Division

P O Box 20296
Billings, Montana 59102

John S. Anderson, M.D.
Director

Comments by Montana Department of Health and Environmental Sciences
on

Draft Environmental Impact Statement

for

Water Reservation Application

Yellowstone River Basin

January 5, 1977

Introduction

The Department of Natural Resources and Conservation is to be commended for preparation of the EIS. The draft statement describes rather thoroughly the ramifications of various future water use scenarios. The Department of Health and Environmental Sciences ask that the following comments be considered in preparation of the final EIS.

Dear Mr. Metzler:

Wayne Metzler, Environmental Coordinator
Department of Natural Resources and Conservation
32 South Ewing
Helena, Montana 59601

Specific Comments

See Comment 42

Attached are comments by the Department of Health and Environmental Sciences on the Draft Environmental Impact Statement for Water Reservation Applications in the Yellowstone River Basin.

1. In the "Summary" of the EIS, a figure of \$7,700,000 was mentioned as a potential loss to irrigators given the implementation of the instream flow requests. This figure was defined as "quite tentative" which is probably the case given fluctuating market values and other "various factors." This figure is probably best viewed as a tentative, "gross" economic loss in that no dollar figures have been projected for maintaining the status quo by not diverting water in excess of the instream requests or for the economic loss accrued as a result of excessive diversions which would lower water quality and impact the recreational value of the Yellowstone River. It is understood that the assignment of economic values to high water quality and to recreational pursuits is quite difficult in a quantitative sense; however, if a "ten-

Very truly yours,

J. L. Thomas
J. L. Thomas

JLT:ck

Enclosure

tative" dollar figure can be assigned to the possible economic loss by precluding expanded irrigation with restricted diversions, certainly a dollar value can be derived that will describe the economic value of not diverting excessive amounts of water at a similar level of tentativeness and probability of reality given to the irrigation losses. In this way, a "net" economic figure can be assigned to the water diversions that will be of greater value in deciding the economic aspects of the flow reservation than the "gross" economic loss to irrigators described above. In addition, a "net" dollar figure will encompass the interests of all parties concerned rather than the interests of one special group. The quotation of a \$7,700,000 loss to one group without the economic quantification of other considerations appears to bias this EIS. In this light, economics should not be considered as a viable basis for decision-making until all aspects and ramifications of the flow reservation question are put into economic terms. The evaluation of a gross income is pointless without some knowledge of concomitant expenditures in order to judge profit or loss. If it is impossible to quantify in economic terms the benefits of instream flows, then at least these benefits should be described thoroughly in the same sections that discuss the hypothetical cost to future irrigators of not diverting the water. Alternatively, if the \$7,700,000 is so tentative perhaps it should not be included in the final EIS.

In terms of the above mentioned bias, current water-users in the basin would be most affected by the flow reservations

and the additional water withdrawals that are implied by the reservations. That is, an economic gain to one sector by expanded irrigation could mean an economic loss to current water users, e.g., present irrigators, municipalities, and recreationists, through the reduction of water quality and flow levels as a result of the additional withdrawals. This would appear to be proportionately more important in a downstream direction given the natural decline in the quality of water in the Yellowstone from Gardiner to Sidney and the additive nature of the diversions, both qualitatively and quantitatively. Some clarification should be made of the instream flow needs of current water-users in the basin.

2. The \$7,000,000 in direct cost plus twice that amount in secondary cost appears to be large, but it is likely that estimated benefits from using the water for industrial purposes would be much larger. The Department of Health and Environmental Sciences is not suggesting major industrialization of eastern Montana, but the \$7,000,000 could be put in better perspective by comparing it to monetary benefits of using the water for industry in Montana, using the water to generate hydroelectric power at downstream dams, and providing water for navigation in the lower Missouri River.

3. It is implied (page 209) that the cost to future irrigators of granting the Department of Health and Environmental Sciences' request would be approximately the same as the cost resulting from granting of the Fish and Game request. It is further implied that farmers could not afford to pay the cost of building

storage facilities. The Department of Health and Environmental Sciences' request, however, would not affect diversions during the peak runoff period of May, June and July. Perhaps offstream storage reservoirs would be feasible since they could be filled during this three month period (ignoring the Fish and Game instream flow request). Perhaps some of the \$45 per acre profit from new irrigation could be used to pay for offstream storage facilities that would store during the peak runoff period for releases during August, September and October. The economics of additional storage should be analyzed and presented in the final FIS.

The expansion of irrigation depends on factors other than the availability of land and water, such as national and international markets. There is no guarantee that a market will exist for additional production. Further supply may only depress the price for all farmers. The situation is summarized by Head et al. (1972): "The basic problem of all farmers, those depending on rainfall and (or) irrigation water is the competitive structure of the market for farm products. Under these market conditions it is profitable for the individual farmer, before the masses have done so, to invest in water, new varieties, more fertilizers and in other practices; however, when the masses of farmers follow a similar development, as they eventually do, the aggregative effect is a decline in total market revenue due to the inelastic demand for food." There is no assurance that expansion of foreign and domestic markets will be adequate to absorb additional farm

products and at the same time maintain profitable price levels for farmers.

5. Head et al. (1972) further claims that "The increase in yields and production forthcoming from further irrigation development requires expenditures to induce farmers at other

locations to retire land to offset the increased output in the newly irrigated area. To the extent that these increases and decreases in output at different locations cancel each other, the public must pay twice to hold supplies at a given level; once to increase production in the newly irrigated area, and once to reduce it in non-irrigated areas."

Moreover, as the price of water increases, irrigated acreage in the west would decrease with concomitant increases in dry land farming in both the east and west. From a national viewpoint, expansion of irrigation in Montana may not be the most efficient use of our natural resources. Benefits accruing in the Yellowstone Valley may result in cost to farmers in other parts of the state and country.

6. Table I-7 suggests 700 mg/l as the upper limit for total dissolved solids in order for the water to be classified as having a low salinity hazard. The source of the table is not given. It is true that no rigid standards can be established for salinity because of the reasons stated on Page 55. The U. S. Department of Agriculture in Handbook 60 (Richards, 1954) for example, suggests the following limits:

Salinity Hazard

Conductivity (TDS)*

Low 0-250 (0-160)

Medium 250-750 (160-490)

High 750-2250 (490-1460)

*TDS estimated as .65 X Conductivity

The limits of Table I-7 are somewhat more liberal than those given in Handbook 60. At a minimum, the numbers in Table I-7 should be referenced.

7. No references are given for the numbers in Table I-8. See Comment 60

8. A report by Department of Natural Resources and Conservation (1975), discussing irrigation in the Yellowstone Basin, stated that:

1. Many irrigators now experience drainage and salinity problems.
2. Contributing to irrigation problems are the water distribution networks in the basin which typically deteriorate with age. Many canals and ditches are causing permanently wetted areas, growth and phreatophytes, and erosion and siltation where wasteways and cross drainage structures are not adequately protected and maintained. Technical soils, economics, and water management services would assist farmers in their endeavor to better utilize water for irrigation.

Expansion of irrigation will increase salinity of the river water and result in more drainage and salinity problems for existing irrigators. Perhaps improved management and renno-

vation of existing irrigation systems will allow expansion of these systems and at the same time protect downstream water quality. Page 305 of the EIS, for example, states that "about six acre feet per acre are diverted to provide a depletion of only about two acre feet per acre. Much unused water is lost through evaporation and transpiration by non-crop vegetation." Obviously, there is a great potential to improve management of the basin's water systems. Perhaps the EIS should consider improved management as an alternative source of water for the conservation districts. See Comment 19

9. All the conservation districts requested minimum ^{of 1.5 cfs} ~~increase~~ flows to maintain water levels for their diversion works.

Only one, however, quantified its instream request. It is suggested that all districts be asked to quantify their request for instream flows in order to better gauge the practicality of their request.

10. Existing irrigators in the lower portions of the basin are. See Comment 61

likely to bear the brunt of adverse impacts from substantial increases in irrigation upstream:

1. Their water levels will be lowered by depletion of water upstream.
2. The water they receive will be higher in total dissolved solids, thus accentuating existing salinity and drainage problems. The North Custer Conservation District requested 4,000 cfs in the Kinsey area to maintain an adequate water level for their pumping plant. Figure IV-9, however, indicates that the

when granted, do not appear to be adequately considered in the EIS. For example, if the Montana Department of Health and Environmental Science's (DHES) assertion is correct that ". . . the water cannot be legally allowed to exceed recommended limits for dissolved solids and sulfates . . ." by virtue of its B-D₃ classification, how can flow reservations be granted in excess of the DHES request which was based on this legal requirement? In addition, other violations of the State's water quality standards are conceivable in addition to dissolved solids and sulfate as a result of large diversions, e.g., turbidity, temperature and dissolved oxygen. Although the State's water quality classifications are typically related to wastewater inputs to a stream from point sources, such standards may and should be equally applicable to water diversions since both the inputs and the outputs of water could result in a degradation of stream quality and a violation of State standards. If this is not the case, then some philosophical and legal redefinition or clarification of the purpose of water quality standards appears to be in order. If this is the case, then the question of whether water diversions can be eliminated after infiltration becomes pertinent if it is proven that a particular water withdrawal increases water temperatures, turbidities, dissolved solids, sulfates, or some other water quality parameter in excess of State standards. Elevations of temperature, increases of dissolved solids, and depressions of dissolved oxygen are projected for parts of the basin as a result of certain reservation alternatives described in the EIS. In view of the State's water quality criteria, the question of whether it is justifiable to degrade water quality through diversion to levels described in the EIS becomes the critical point that has to be resolved before meaningful assessments can be made. The roles of the Board of Health

average flow "after development" of the High Irrigation Emphasis Alternative would be about 4500 cfs in August and 5000 cfs in September. Low flows (one year in ten) would be only about 1000 cfs in August and 2000 cfs in September. Consequently, conservation districts instream flow probably would be met only six or seven years out of ten. August and September would also experience significant increases in salinity during low flow years. This suggests that even without reservations of instream flows by the Fish and Game Department and the Department of Health and Environmental Sciences, there will be a conflict between existing downstream irrigators and potential upstream irrigators. Perhaps the EIS should examine more closely this probable conflict.

11. It is suggested that current water rights be quantified and adjudicated rapidly as possible in order to allay the fears of existing irrigators that granting of an instream flow reservation will interfere with their historical rights.

12. As the EIS clearly states, both the Powder and Tongue Rivers would experience significant degradation of water quality and disruption of the aquatic ecosystem under the "no action" and "irrigation emphasis" scenarios. Therefore instream flows should be protected in these streams.

General Comments

Certain legal ramifications of the flow reservations, which would imply a sanction by the State of Montana of future water diversions See Comment 55

Montana Department of Natural Resources and Conservation, 1975. Yellowstone River Basin. Water Resources Situation Report, Water Resources Division, Helena, Montana.

Richard, L. A. (Editor), 1954. Diagnosis and Improvement of Saline and Alkaline Soils. Agriculture Handbook 60, United States Department of Agriculture.

and the Board of Natural Resources appear to be antagonistic in this regard. One state law provides for the maintenance of water quality through the establishment of water quality standards. Another law prescribes a procedure to obtain the right to divert water from a stream with no regard to the effects of that diversion on water quality.

The probable incremental nature of the degradation of water quality as a result of water diversions should be considered in relation to the State's water quality standards. For example, individual increases of turbidity on the order of 2 JTU as a result of single water withdrawals would not violate standards whereas the cumulative effect of three or four of these diversions could produce a total increase in turbidity that would violate the criteria for this parameter. Although the EIS has assessed the cumulative or total impact of the different flow reservation alternatives and potential water diversions, these withdrawal impacts, in reality, will be incremental in nature through time. If the State water quality standards do apply to water diversions, then some baseline quality and judgemental criteria have to be established for the impacted streams as a basis for determining the total amount of change in water quality at any given point in time and after each diversion in order to avoid the occurrence of an incremental degradation of water quality as illustrated previously. The reservation of instream flows for maintenance of water quality provides a mechanism whereby baseline quality can be protected for the benefit of all users.

References

Heady, Earl O.; Howard C. Madson, Kenneth J. Nicol, and Stanley H. Hargrove. Analysis of Water Policies and the Environment: An Analysis of National Alternatives in Natural Resource Use, Food Supply Capacity and Environmental Quality. CARD Report 401, Center for Agricultural and Rural Development, Iowa State University, Ames Iowa.



The Big Sky Country

MONTANA STATE HOUSE OF REPRESENTATIVES

REP. ORVAL S. ELLISON
100 WEST BOWLING GREEN
BILLINGS, MONTANA 59101
PHONE 232-2128

COMMITTEE
ON NATURAL RESOURCES
FISH AND GAME

January 6, 1977

Select Committee
on Water

Hearing Officer, DNR
Yellowstone Basin EIS

TESTIMONY

Presented at hearing on Yellowstone Basin EIS at Livingston,
Montana, January 7, 1976

See Comment 62

It is my understanding that much of the statistical data contained in the draft EIS was taken from the Department of Fish & Game publications. In as much as the Department of Fish & Game has requested one of the larger reservations, I am concerned about the propriety of so much reliance being placed on this agency's data.

I feel that some of the data has little basis in fact. Flow data of several tributaries are little more than "educated guesses." The decisions made by the Board of Natural Resources based on the above mentioned EIS will vitally affect the future of Montana. Therefore, I feel more independent research should go into this Environmental Impact Statement.

Respectfully submitted,

Orval S. Ellison
Orval S. Ellison
Rep. - HD #73

Montana Water Development Association

P. O. BOX 1574, BILLINGS, MONTANA 59103

December 30, 1976

Via Certified Mail

RECEIVED

JAN 3 1977

Department of Natural Resources and Conservation
321 Grand Street
Helena, Montana 59601

MONT. DEPT. OF NATURAL
RESOURCES & CONSERVATION

Subject: Draft Environmental Impact Statement for
Water Reservations Applications in the
Yellowstone River Basin - Volumes I & II.
Dated December 13, 1976.

Enclosure:

EXECUTIVE SECRETARY
MONTANA WATER DEVELOPMENT ASSOCIATION
Box 1574
Billings, MT 59103

DIRECTORS

DAVID B. BROWN
D.P. FABRICH
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Crosby, MT
Bretton, MT

MEMBERS

MARCOLENT
Billings, MT

See Comment 63
In accordance with the 30-day objection period under the Water Use Act, the Montana Water Development Association objects to the Moratorium and Regulations regarding applications for reservations of water in the Yellowstone basin as they are discriminatory and therefore appear to be unconstitutional.

See Comment 64
Reservations requested are not realistic and bear no relationship to water to be used for beneficial uses. We object to the granting of reservation rights especially prior to the final presentation of a statewide plan. The Yellowstone River Compact must be considered in the reservation and apportionment.

See Comment 65
As an example the Fish and Game application for 8.2 million acre feet from the Big Horn River to the North Dakota state line permits nearly the entire flow of the Yellowstone River in an average year to flow out of the state depriving beneficial uses within the state of Montana.

Federal reservations including Indian water rights apparently have not been taken into consideration.

You are respectfully requested to enter our objections specifically to the permit and reservation procedures as now constituted.

Sincerely
M. S. Ellison
M. S. Edleman
President

Montana Water Development Association

P. O. BOX 1574, BILLINGS, MONTANA 59103

January 6, 1976

OFFICERS

PRESIDENT

M. E. COLEMAN
Woods, MT 59088

VICE PRESIDENT

EARLYN P. GARDNER
Billings, Montana
Sec. Bank Bldg
Billings, MT 59101

VICE PRESIDENT

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Whitish, MT 59789

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Helena, MT
Wm. Killips
Krieger, MT
Wm. Shortridge
Bozeman, MT
TED WILLIAMS
Bozeman, MT
HAROLD LUTZ
Harlow, MT

55

A great deal of work incurring many man-hours of labor has gone into production of the two volumes.

See Comment 5

My objection to this FIS is that it is much too long to read and be digested by the majority of people who are interested in this matter.

Sincerely



C. R. Beitman
Executive Secretary



Kevin F. Glaes
1850 South 5th, West
Helena, Montana

January 5, 1977

Dear Mr. Metzger:

Dept. of Natural Resources and Conservation
32 South Wing
Helena, Montana

Dear Mr. Metzger:

The Montana Council of Trout Unlimited would like to express to the Department of Natural Resources and Conservation a great desire to reserve free-flowing water in the Yellowstone Basin for instream uses. The amount of water needed to maintain fish and wildlife populations and water quality at existing levels is great, as evidenced by the applications filed by the Dept. of Fish and Game and the Dept. of Health and Environmental Sciences. But the members of Trout Unlimited will strongly disagree with any recommendations by the D.N.R.C. which would result in the lowering of fish and wildlife populations and degradation of water quality.

One hundred and three miles of the Yellowstone River are designated as "blue ribbon". That is 23 percent of the stream mileage in Montana so designated. The long free-flowing length and high water quality of the Yellowstone makes it unique in the United States. There exists a great need in Montana and the United States to preserve this drainage as it is today.

The key to sustaining viable fish and wildlife populations is to protect the existing habitat. Instream flows to protect the existing habitat must be reserved in the Yellowstone Basin. Do not pass over lightly the requests for instream flows on the small tributaries. These are the spawning grounds for the fish populations in the river and must be protected to insure future wild fish.

Each year, more fishing and hunting licenses are sold and more and more people are using the Yellowstone Basin streams for the recreational values found there. Requests for instream flows must be granted to insure that future generations of Montanans will be able to experience the pleasures of the Yellowstone Basin streams that we have come to know.

Maintaining high water quality in the basin is another factor which the Dept. should strongly consider when making its recommendations. High water quality is beneficial to everyone. Degradation of water benefits no one.

Sincerely,
Kevin F. Glaes
Chairman, Montana Council
Trout Unlimited



The Big Sky Country
MONTANA STATE SENATE

SEN. PETER R. STORY
DISTRICT NO. 37
LEGISLATOR, BOZEMAN, MONTANA 59027

COMMITTEES:
GOVERNMENT
STATE ADMINISTRATION

across private land over which the public enjoys no easement. So such recreational use as the public does enjoy is entirely dependent upon cordial relations with the several land owners. Such relations are not materially enhanced by anything the Fish and Game would do. The best bet for continued recreational enjoyment would be for the Fish and Game Department to butt out.

For these reasons, I and the other owners of Fridley Creek request that Fridley Creek be excluded completely from any consideration the Department of Natural Resources might give to the remaining reservation.

We also request that this statement be entered into the permanent record of this proceeding.


Peter R. Story, Senator
District No. 37

/sjh

See pp. 3-4 of F6's

Response

My name is Pete Story. I am a rancher at Emigrant. Previously I have protested in writing the entire reservation of water of the Fish and Game Department. I have since read a copy of the report upon which the Fish and Game Department bases its requests. I now respectfully submit a written protest specifically on Fridley Creek.

First, the information supplied regarding Fridley Creek is simply not based upon fact. The request states that the water is needed to provide for the migration and spawning of white fish and various species of trout from the Yellowstone River.

The fact is that Fridley Creek does not flow into the Yellowstone River and has not done so since 1937. The main branch of Fridley flows into the Park Branch Canal. The southern branch flows into the supply channel of the same canal. Since 1937 a headgate about 200 yards above the supply channel has prevented fish from moving upstream to migrate or spawn and none have done so.

It is apparent that the Fish and Game has never actually studied Fridley Creek, and in fact, they were denied permission to do so when they asked to.

Secondly, the waters of Fridley Creek have been appropriated in their entirety, including high water. The owners of these rights have used these waters not only in the normal irrigating season but in all times of the year - for replenishing reservoirs, for livestock and even for the production of electricity, and they have a constitutionally protected right to continue to do so.

Thirdly, the Fish and Game Department mentions an increasing recreational use of Fridley Creek which it seeks to enhance. It is true that certain portions of Fridley Creek do indeed contain an Eastern Brook Trout population which people do fish. However, access to these areas is entirely



United States Department of the Interior
BUREAU OF LAND MANAGEMENT
222 North 32nd Street
P.O. Box 30157
Billings, Montana 59107

DATE

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JAN 6 1977

MONT. DEPT. OF NATURAL
RESOURCES & CONSERVATION

Mr. Wayne Wetzel
Montana Department of Natural
Resources and Conservation
32 South Ewing
Helena, Montana 59601

Dear Mr. Wetzel:

We have reviewed the Draft Environmental Impact Statement prepared by your Water Resources Division and titled "Yellowstone River Basin, Water Reservation Applications." Our comments are listed below in format generally following the content of our objection to these reservations filed with DNRC on December 21, 1976. A copy of our objection (Form 611) and the letter of explanation are enclosed.

See Comment 67

1. In that the Montana Water Use Act denies the federal government and private sector the opportunity to declare future water needs, the impacts of reservation granting cannot be adequately assessed. In fact, your document acknowledges a shortage of information on amount and location of industry needs (page 195). The same is true of needs for federal land and mineral management programs.

See Comment 68

2. The impacts related to large scale granting of water reservations to state subdivisions cannot be adequately evaluated until the federal and Indian reserved rights are quantified. These reserved rights pre-date and therefore hold precedent over any water reservations granted under the Montana Water Use Act.

See Comment 69

3. Preparation of this EIS draft and its review is taking place before the reservation objections are reviewed in public hearing (scheduled for February). It is highly probable that these legal objections and their public airing will surface conflicts and allocation problems not addressed in the EIS. It is our position that all objections be resolved before preparation of this EIS draft, as the objections themselves represent conflicts that must be covered in the EIS.

IN REPLY REFER TO:
1793 (962)

See Comment 70

4. The state appears to be circumventing its own established legal process. The 1973 Water Use Act provides for court adjudication of water rights in the state; the state has assigned Yellowstone Basin as first priority. As of this date, adjudication of the first drainage in the Basin (Powder River) has not been completed. Further, it is our understanding that the Water Rights Bureau is encountering some difficulty in identifying and quantifying established water uses that predate the 1973 Act. This shortcoming is acknowledged on page 5. In view of this paucity of knowledge regarding existing rights, it is unrealistic to expect an adequate assessment of impacts resulting from granting of the reservations. Quantification of existing rights established by historical use and of federal and Indian reserved rights should precede preparation of this EIS.

See Comment 71

5. A primary impact of the Fish and Game reservations is stated as "... maintain water quality by limiting agricultural and industrial development which could pollute the streams (page 192). We submit that this is a negative approach to problems related to industrial development. BLM's concern is with retaining options for wise development of the nation's surface and mineral resources. The concern for water quality is dealt with by existing water quality legislation (PL 92-500, 33 U.S.C. 1161) and should not be decided by allocation of the resource. Further, tying up the available surface water will increase the need for construction of transmission and storage facilities; the impacts of which must also be addressed.

See Comment 72

6. Due to the fact that the reservation applications have not been acted on by the State, and presumably will not be before the final draft is prepared, this document does not address a specific proposed action. It is our contention that, to be meaningful, it should analyze a proposed action and compare the impacts with alternatives. This would permit much more worthwhile public participation.

See Comments 34, 64, 81, and 131

In summary, we are of the opinion that the State of Montana is approaching the question of massive allocations or reservations of water for future use with admittedly insufficient data. Extensive commitments of water holding prior right have not been quantified. These include the rights of historical users, those rights associated with millions of acres of federal and Indian land, and the water allocated to Wyoming through the Yellowstone River Compact.

See Comment 76

Further, the EIS is of very limited value because it fails to address a specific action. A programmatic type environmental statement is inappropriate where an action of such magnitude is to take place within a very short time period.



3
See Comment 73
It appears that the state is attempting to expedite this statement in order to meet the Yellowstone moratorium deadline; in the process, it is seriously compromising the intent of environmental assessment.

Sincerely yours,


Edwin Zaidlicz
State Director



EDUCATION -- CONSERVATION

Montana Wildlife Federation

AFFILIATE OF NATIONAL WILDLIFE FEDERATION



Route 1, box 338
Bozeman, MT, 59715
January 7, 1977

1-20-77
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JAN 10 1977

Hearing Officer
State of Montana
Department of Natural Resources & Conservation
Helena, Montana 59601

Enclosure

The Montana Wildlife Federation appreciates the opportunity to comment on water flow reservations in the Yellowstone River drainage.

The Montana wildlife Federation supports the Montana Fish and Game Commission application for reservation of water in the Yellowstone River Basin.

Our concern is that water rights for instream beneficial use by fish and wildlife be granted, as provided for by the Montana Constitution, to protect the natural resources and associated recreation. Our concerns, and the needs and purposes for these water rights have been presented in the Montana Fish and Game Commission Application dated November 1, 1976 and need not be repeated here.

Please make this letter part of the hearing record.

Sincerely,

Harry McNeal, President
Montana Wildlife Federation

NORTHERN PLAINS RESOURCE COUNCIL

Main Office
4111 Steptoe Bldg
Helena, MT 59601
(406) 248-1154

Field Office
P.O. Box 886
Glenwood, MT 59330
(406) 365-2525

Wayne Wetzel
Environmental Coordinator
Department of Natural Resources & Conservation
32 South Easting
Helena, MT 59601

January 10, 1977

Dear Wayne:

In reviewing the Draft Environmental Impact Statement for the Department's Water Reservation Program we have the following comments:

In general the DEIS seems to have adequately explored the potential environmental impacts of various levels and types of water resource development in the Yellowstone Basin. We feel that the Department should be commended for producing a document which is non-technical enough to be readable and generally understandable to the lay person, and is of manageable size for a publication which has as its subject 30 separate water reservation applications.

The Northern Plains Resource Council has supported the concept of reserving water for future use and has encouraged Conservation Districts and Irrigation Projects to take advantage of the program in order to assure adequate future water supplies for agriculture in the Yellowstone Basin. We feel that the program is a step in the right direction in planning for the future use of the Yellowstone Basin's precious water resource.

We do feel that it would have been advantageous for the Department to have provided the public with more time to review the document, but we are also aware of the time constraints imposed by the impending expiration of the Yellowstone Moratorium. Had the Department been able to carry out its responsibilities within the three year time frame provided by the Moratorium, this problem would not have arisen.

See Comment 12

We have two specific comments as follows: (1) A number of Conservation Districts have applied for more water for future irrigation development than the Department has determined is feasible based on farm budget analyses. Some Conservation District members have voiced their belief that the Department's findings of feasible irrigable acreage are on the conservative side, and have pointed to examples of past studies which have inaccurately portrayed the potential for irrigation development in some areas which were subsequently developed. We feel that in considering the reservation requests of the Conservation Districts the Board should keep in mind that the feasibility findings of the Department quite possibly reflect conservative estimates of the future development potential of the Basin.

Regarding instream flows: Much attention has been given to the Fish and Wildlife Commission and Department of Health and Environmental Sciences large requests for instream flows. According to the DEIS "There is not enough water physically

in the basin to satisfy all water reservation requests that have been filed." All reservation requests are, of course, subject to existing water rights and in no way jeopardize those prior rights.

The Fish and Game Commission request is for variable monthly flows and conflict with the projected consumptive demands of agriculture only during the month of August -- an important month from the point of view of irrigators and the instream requirements of aquatic life.

We endorse the principle of the maintenance of some level of instream flow for the satisfaction of both fish and game and water quality requirements, and in order to guarantee the availability of water to prior users during low flow periods. All the Conservation District applications have also requested instream flows in order to guarantee the efficient operation of diversion works and pumping facilities.

The point here is that the instream requirements for fish and wildlife needs and water quality maintenance, and the consumptive use requirements of a dynamic agricultural economy are not necessarily mutually exclusive. It is our hope that a satisfactory balance can be achieved between the demands of water for the Yellowstone Basin's agricultural economy, and the necessity of maintaining an adequate supply of good quality water in the Yellowstone and its tributaries in order to preserve the Basin's current high quality of life.

Sincerely,



David Alberswerth, staff
Northern Plains Resource Council

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JAN 11 1977

MONT. DEPT. OF NATURAL
RESOURCES & CONSERVATION
Department of Natural Resources and Conservation
Capitol Station
Helena, Montana 59601

TREASURE CONSERVATION DISTRICT
HELSHAM, MONTANA 59038

January 9, 1977

Subject: Comments on the draft E.I.S. concerning Water Reservations on the Yellowstone River Basin, Volume I and II, dated December 13, 1976.

See Comment 74

1. In regard to written comment entered by the WTAPO spokesman at the Miles City hearing, and further supported twice by verbal statements, each time relating to the use of so called salty waters for irrigation.

We do not agree that irrigation waters now are any more detrimental to the soils and return flows than they were 20-30 or 40 years ago. The fact that the waters are more saline or are truly hazardous has not been substantiated either by WTAPO or the information referred to in the draft E.I.S., all of which at this point are speculative and at best based upon short-term research.

The inference was given that "irrigations" are the Williams, when this is not really true. Quality of water in the Yellowstone is not the sole responsibility of agriculture, as many others use it and return it, not always in as good condition as when withdrawn.

2. We support the basic premise of the "Water Use Act" and its provisions for Water Reservations. It is our hope that the reservations will be fairly acted upon by the Board of Natural Resources and Conservation and that their decisions will survive the legal actions that will surely follow.

3. We feel that it is necessary that the "Moratorium" be extended so as to permit all applicants adequate time to follow procedure, attend hearings, prepare communications, have sufficient time to meet and prepare for hearings with counsel. More time is needed particularly so the Board of Natural Resources and Conservation will have sufficient time to hear, study, weigh and decide fairly on the pending applications.

4. We support the idea of off-stream or upstream storage on the Yellowstone River. The Yellowstone River is practically the only large free flowing river in the Northwest. In order to provide for flood control, volume controls in low flow periods etc., these types of structures would be invaluable.

5. As to priorities of use on the Yellowstone, we feel that the following order has to be considered in order to have adequate quantity and quality of water, support people and the food base.

- a.) Agriculture
- b.) Cities and towns
- c.) Water Quality (D.H.& E.S.) and Wildlife-Recreation (Fish and Game)
- d.) Industry

Thank you for your consideration.

Sincerely,

Howard Hadden

Howard Hadden
Chairman

HH:bd

cc: Sen. Dave Manning
Rep. E. Dassinger
C. Dist. file

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JAN 11 1977
MONTANA DEPARTMENT OF NATURAL
RESOURCES & CONSERVATION
WATER

ROSEBUD CONSERVATION DISTRICT
FORSYTH, MONTANA 59327

January 9, 1977
Forsyth, Montana 59327

Department of Natural Resources and Conservation
Capitol Station
Helena, Montana 59601

Subject: Comments on the draft E.I.S. concerning Water Reservations on the Yellowstone River Basin, Volume I and II, dated December 13, 1976. See Comment 74

1. In regard to written comment entered by the WYAPO spokesman at the Miles City hearing, and further supported twice by verbal statements, each time relating to the use of so called salty waters for irrigation.

We do not agree that irrigation waters now are any more detrimental to the soils and return flows than they were 20-30 or 40 years ago. The fact that the waters are more saline or are truly hazardous has not been substantiated either by WYAPO or the information referred to in the draft E.I.S., all of which at this point are speculative and at best based upon short-term research.

The inference was given that "irrigators" are the williams, when this is not really true. Quality of water in the Yellowstone is not the sole responsibility of agriculture, as many others use it and return it, not always in as good condition as when withdrawn.

2. We support the basic premise of the "Water Use Act" and its provisions for Water Reservations. It is our hope that the reservations will be fairly acted upon by the Board of Natural Resources and Conservation and that their decisions will survive the legal actions that will surely follow.

3. We feel that it is necessary that the "moratorium" be extended so as to permit all applicants adequate time to follow procedure, attend hearings, prepare communications, have sufficient time to meet and prepare for hearings with counsel. More time is needed particularly so the Board of Natural Resources and Conservation will have sufficient time to hear, study, weigh and decide fairly on the pending applications.

4. We support the idea of off-stream or upstream storage on the Yellowstone River. The Yellowstone River is practically the only large free flowing river in the Northwest. In order to provide for flood control, volume controls in low flow periods etc., these types of structures would be invaluable.

5. As to priorities of use on the Yellowstone, we feel that the following order has to be considered in order to have adequate quantity and quality of water, support people and the food base.

- a.) Cities and towns
- b.) Agriculture
- c.) Water Quality (D.H.&E.S.) and Wildlife - Recreation (Fish & Game)
- d.) Industry

Thank you for your consideration.

Sincerely,

J. M. Mansel Chairman

Joe Mansel
Chairman

JN:bd

cc: Sen. Dave Manning
Rep. E. Deasinger
C. Dist. file

January 8, 1977

REC-1970

JAN 11 1977

Montana State Dept. of Natural Resources
and Conservation
Helena, Montana

MONI. DEPT. of NATURAL
RESOURCES & CONSERVATION

Subject: Hearing Yellowstone River Basin Environmental
Impact Statement. Livingston, Mt.

Attn: Department Chairman

The department is to be commended for the manner in which
the hearing was conducted and the information and discussion
presented.

Although it is not without shortcomings, the Yellowstone
River Basin Environmental Impact Statement, clearly shows
the need for careful planning in the use of water from
the Yellowstone Basin.

The free flowing upper Yellowstone river and it's fine
trout fishing is of vital concern to me and many other
fishermen. We are hopeful that an assignment of a water
use reservation to the Montana Fish and Game Department,
for instream flows, to maintain this valuable non-consump-
tive use will receive high priority with your department
and the board.

Respectfully;

Bud Lilly
Bud Lilly
National Senior Advisor
Federation of Flyfisherman
West Yellowstone,
Montana

C.C. Ron Marcoux

DR VINCENT P RINGROSE JR.
507 NEW BRITIAN RD
KENSINGTON CT 06037

U U Mailgram
western union



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JAN 11 1977

WAYNE WETZEL
CHIEF, WATER RESOURCES DIVISION
DEPT OF NATURAL RESOURCES AND CONSERVATION
32 SOUTH EWING
HELENA MT 59601

MONI. DEPT. of NATURAL
RESOURCES & CONSERVATION

THE FEDERATION OF FLY FISHERMEN, NUMBERS NEARLY 50,000 MEMBERS FROM
COAST TO COAST, MANY OF WHOM FISH MONTANAS BLUE RIBBON STREAMS EVERY
SEASON, EFF WISHES TO STRENGOUSLY ENDOSE THE "APPLICATION FOR
RESERVATION OF WATER ON THE YELLOWSTONE RIVER BASIN" BY THE MONTANA
FISHING GAME COMMISSION. THIS SUPERBLY RESEARCHED APPLICATION PRESENTS
COMPELLING SCIENTIFIC EVIDENCE FOR CAREFUL ALLOCATION OF INSTREAM
WATERS SO AS TO PRESERVE A PRICELESS FREE FLOWING BLUE RIBBON STREAM
THIS CAN BE DONE WITHOUT DEPRIVING OTHER JUST CLAIMANTS A FAIR SHARE OF
THE WATER THE FISHING GAME COMMITTEE HAS ADOPTED THIS APPROACH, AND WE
URGE YOU TO FAVORABLY CONSIDER THEIR APPLICATION.

FEDERATION OF FLY FISHERMEN
DR VINCENT P RINGROSE, JR
EXECUTIVE VICE PRESIDENT

2243 EST

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JAN 11 1977

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JAN 11 1977

P. O. Box 467
Absarokee, Montana 59001
10 January 1977

MONT. DEPT. OF NATURAL
RESOURCES & CONSERVATION

Department of Natural Resources and Conservat' on
Helena, Montana 59601

MONT. DEPT. OF NATURAL
RESOURCES & CONSERVATION

CONSOLIDATED OBJECTIONS AND COMMENTS OF
UTAH INTERNATIONAL, INC. TO THE DRAFT ENVIRONMENTAL
IMPACT STATEMENT FOR WATER RESERVATION APPLICATIONS
IN THE YELLOWSTONE RIVER BASIN PREPARED BY THE
MONTANA DEPARTMENT OF NATURAL RESOURCES AND
CONSERVATION, WATER RESOURCES DIVISION

Gentlemen:

I wish to comment on the water reservation applications in the Yellowstone basin.

First, the applications for the purpose of sustaining instream flows are appropriate and essential, though precise amounts could be modified. Water to meet minimum instream requirements is a top priority. Also, requests for reservations for irrigation uses, current and future, are essential, if total amounts requested for these two categories are greater than the amount available adjustments can be made, but both requirements must be met.

Municipal and domestic needs must, of course, be fulfilled, but reservations and such uses to meet inflated expansion at the cost of in-stream needs and agricultural uses should not be permitted. Municipal growth must not be permitted at the cost of those needs.

These categories must take precedence over other uses, including industrial development, and any final decision and allocation of water should recognize such priorities. Main-stream storage is not a satisfactory answer, as it would only benefit and encourage industrial development, creating new demands on often limited supplies, both with increased municipal uses and additional industrial waste. It would provide little or no direct benefit to agriculture, while stimulating additional competition for scarce water, and at the same time destroy a major free-flowing river while disrupting the natural ecosystems now dependent on that river.

Thank you for this opportunity to comment. I will be very interested in hearing of any action planned or taken in this matter.

Sincerely,


Francis J. Walcott

Pursuant to the Montana Environmental Protection Act, the Montana Administrative Procedures Act, and the Montana Administrative Code, Utah International, Inc. (hereinafter "Utah"), an applicant for the beneficial use of water in the Yellowstone River Basin, hereby submits its objections and comments to the Draft Environmental Impact Statement for Water Reservation Applications in the Yellowstone River Basin (hereinafter "Draft EIS") prepared by the Montana Department of Natural Resources and Conservation, Water Resources Division (hereinafter "DNRRC"), a copy of which was received by the firm of Poore, McKenzie, Roth, Robischon & Robinson, P. C. on December 15, 1976.

I.

OBJECTIONS TO DRAFT ENVIRONMENTAL IMPACT STATEMENT

Utah objects to the Draft EIS upon the following grounds and for the following reasons:

See Comment 75

1. The distribution of the Draft EIS violates MAC, Section 16-2.2(2)-P2040 (Rule V), subsection (4) (a) for the following reasons:

Because Utah's application for the beneficial use of water under the Yellowstone River Compact had been filed with the Water Resources Division of the DNRRC on November 20, 1973, Utah was and

is an individual to whom the Draft EIS should have been transmitted. The cited MAC regulation requires that the Draft EIS be distributed to Utah not less than 30 days prior to the time written comments to the Draft EIS are required. The Draft EIS was not distributed to Utah by the DNRC, but a copy of the Draft EIS was transmitted to Poore, McKenzie, Roth, Robischon & Robinson, P.C. on December 15, 1976, together with a Notice of Hearings to Be Held in Livingston, Billings, Miles City, and Glendive, and Appointment of Hearing Examiner. The 30 days required under the cited MAC regulation expire January 14, 1977, and therefore, the DNRC has violated the provisions of the cited regulation. See Comment 76

2. The Draft EIS, contrary to Section 69-6518(6), R.C.M., 1947, fails to state whether or not the Governor of the State of Montana designated the DNRC as the lead agency to collect one fee for the preparation of the EIS. See Comment 77

3. The Draft EIS fails to comply with MAC, Section 16-2.2(2)-P2040 (Rule V). See Comment 78

4. The Draft EIS violates Section 69-6504(3) and (4), R.C.M., 1947.

II.

COMMENTS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT See Comment 78

1. On page 6, the DNRC states that the Draft EIS "is more programmatic in nature than a detailed analysis limited to a specific project," and therefore, the DNRC has failed to comply with the requirements of a draft environmental impact statement pursuant to applicable statute and regulation and has failed to draft

an environmental impact statement which fulfills the function of a draft environmental impact statement. Moreover, the Draft EIS, on pages 6 and 7, reflects that the applications "present general proposals for the future, and specific project data are not available. In some cases, preparation of a more detailed impact statement, specific to that single project, may be required." It is self-evident that this statement renders completely abortive the environmental impact statement process contemplated by the DNRC in that the applications are already pending and the Draft EIS is intended to be a comment upon the environmental impacts created when "major actions of state governments significantly" affect the human environment. Section 69-6504(3), R.C.M., 1947.

2. On pages 1 and 2, the following comment appears: See Comment 79
"The priority date of any new water right subsequently approved will reflect the original date of application. However, any water reservation approved by the Board prior to the approval of the permits will have a preference of use over the permits."

This comment is obviously a misstatement of the law. This commentator filed duplicate applications with the DNRC for Powder River water pursuant to the Yellowstone River Compact on November 20, 1973. These filings, being File Numbers 1004, 5, and 6, S42J, were given a priority date of November 20, 1973, by the DNRC. The Yellowstone River Basin Moratorium Act (Section 1, et seq., Chapter 116, Laws of 1974; 89-8-103, R.C.M., 1947, et seq.) was not enacted until 1974, thus subsequent to Utah's priority date. Pursuant to Section 89-891, R.C.M., 1947, the priority of Utah's right, when granted, will relate back to November 20, 1973. Thus, it would be

totally unconstitutional and a taking of property without due process of law for any reservation application filed subsequent to November 20, 1973, to have a priority date over Utah's application.

3. On page 2 of the application appears the following statement: See Comment 80

"The 1967 Legislative Assembly directed that a state water plan be developed for Montana to guide future water use. That water plan, not yet completed for the Yellowstone Basin, is scheduled to be finished by mid-1978. However, many of the options available under the water plan may be accomplished or foreclosed through the decisions on reservation requests. Hence, the Board's action may, at least in part, constitute the framework of the state water plan."

This statement totally ignores Article IX, Section 3, 1972 Constitution of Montana, and the provisions of the Montana Water Use Act, Section 89-865, et seq., R.C.M., 1947, which contemplate that private individuals, corporations, and entities retain the right to apply for and appropriate for beneficial uses state waters.

4. On page 5 of the EIS appears the following statement: See Comment 81
"There is not enough water physically in the basin to satisfy all water reservation requests that have been filed. In addition, due to legal difficulties, it is not presently known exactly how much unappropriated water is available."

This statement most graphically illustrates the fact that the EIS is premature and that no major state action with regard to the applications for reservations, which the DNRC purports to treat in its Draft EIS, can be effected until unappropriated waters of the Yellowstone River Basin have been quantified.

5. With regard to its predictions as to irrigation land development within the Powder River Basin, the statement totally

fails to substantiate the predictions that: (1) appreciably more land will be irrigated within the Powder River Basin; (2) a future need exists for development of a more irrigable acreage within the Powder River Basin; (3) that farm and ranch owners in the basin will opt for developing more irrigable acreage; (4) that the development of substantially more irrigable acreage within the Powder River Basin is economically feasible.

6. On page 20, the following statement is made: See Comment 83

"It should also be noted that commitments of water made through reservations would probably have the effect of discouraging speculative permit applications in the future, regardless of the specific beneficial use involved."

Speculative permit applications are hardly possible under the Montana Water Use Act, since the Act and the Constitution of the State of Montana require that water be applied to a "beneficial use," and the DNRC may set the time limits within which the diversion facility must be completed. Section 89-880, R.C.M., 1947, and Section 89-886, R.C.M., 1947. See Comment 84

7. Utah is of the opinion that the DNRC inappropriately restricted its application (9941-r) for reservation of water in the Powder River Basin to storage at the Moorehead site without giving consideration to other alternatives and that the Department erred in preparing the Draft EIS by not giving consideration to other alternatives.

Moorehead Reservoir would require the construction of a large mainstream dam across a river that is characterized as "too thin to plow and too thick to drink." As such, a very large reservoir

having a total capacity of 1,150,000 acre feet is required, more than half of which is dedicated to the storage of silt that would be trapped in the reservoir. When filled, the reservoir would inundate 18,200 acres of land extending more than 30 miles upstream from the dam into Wyoming. In the semiarid climate, evaporation losses will be high, and eventually, its utility in providing water for beneficial purposes including flood control and recreation will progressively diminish because of the unavoidable impoundment of silt.

Utah believes that the opportunities of developing Montana's share of Powder River water by means of one or more smaller off-stream reservoirs should be thoroughly investigated before any irreversible commitment is made to reserve water for storage at Moorhead or other mainstream sites. Off-stream storage supplied by diverting water from the Powder River by means of a low diversion dam and pumping such water to a storage facility on a tributary stream would have a number of advantages over a mainstream impoundment, among which are:

- (a) The maximum rate at which water could be withdrawn from the river would be limited to the capacity of the diversion and pumping facilities, thus resulting in much less drastic changes in the reasonable pattern of flow of the river downstream than would be the case with a mainstream reservoir. The salinity of the water immediately downstream from the point of diversion

would not be altered, and suspended sediment contained in the natural flow would be reduced only slightly from that which naturally occurs. The combination of these factors would have much less adverse effect on fish and other aquatic life than would be the case of a mainstream reservoir which would inevitably and significantly alter the pattern of flow, the temperature of the water, and the concentration of dissolved and suspended material from those that naturally prevail.

See p. 4 of Fg's Response

- (b) With appropriate works at the diversion points and pumping plant, much of the coarser silt can be excluded from the water diverted to off-stream storage facilities with the end result that proportionately less silt will be impounded in the off-channel reservoir. Thus, the useful annual water yield in relation to the capacity of the off-stream storage facility will be much greater than in the case of a mainstream reservoir.

- (c) The total land area that would be inundated by off-stream storage facilities having a yield comparable to that of a mainstream reservoir would be much less with the result that non-beneficial evaporation loss will be considerably less than with a mainstream reservoir.

(d) With the off-stream storage scheme, much of the original silt contained in the river flow will remain in the stream. While outwardly it might appear that this would be a disadvantage, it is actually desirable in the case of an alluvial stream having highly variable flows such as the Powder River. The elimination of scouring floods and the release of clear decanted water from a mainstem reservoir will cause the channel to deteriorate with the result that when an unusual flood does occur, flood damages in downstream areas can be much greater than they would be without the mainstem dam. Complete removal of sediment from an alluvial stream inevitably has adverse effects on downstream irrigation systems, causing deterioration of earthen channels, increased seepage losses, and overall loss of efficiency in conveying water to lands to be irrigated. Numerous examples of the adverse effects of the release of decanted water from reservoirs on irrigation systems could be cited such as the Colorado-Big Thompson Project and canals below the Pueblo Reservoir on the Arkansas River in Colorado and canals below Glendo and Guernsey Reservoirs on the North Platte River in Wyoming and Nebraska.

(e) Finally, an off-channel storage facility does not necessarily represent a perpetual commitment to the

storage of water and attendant impoundment of silt. Presumably, the life of a reservoir constructed to provide water for an industrial use, as for example, the conversion of coal to other forms of energy, would have a life corresponding to that of the non-renewable resource. When that resource had been depleted, the reservoir would no longer be required, and the Powder River would then flow unimpeded by man-made works. With a mainstem reservoir, this condition would prevail only after the valley upstream of the dam had been permanently transformed to a barren silt plain.

Utah notes that the DNRC request for storage at the Moorehead site on the Powder River is apparently predicated, insofar as engineering features are concerned, upon the reconnaissance report on the Moorehead unit prepared by the U.S. Bureau of Reclamation in 1969. It is further noted that it is stated on page 10 of the Bureau report that "storage by diversion to off-stream sites as an alternative to Moorehead Dam and Reservoir was found to be impractical because of the limited capacity of the reservoir sites on tributaries and obvious high costs of diversion works and sediment control." Utah believes that the foregoing conclusion made eight years ago should be re-examined and that the adverse environmental impacts of a mainstem reservoir be realistically evaluated.

8. Utah is of the opinion that the Draft EIS understates the probable level of use of water for energy and industrial purposes in the Powder River Basin.

Under the discussion of the Energy-Emphasis Alternative in the Draft EIS, the estimated requirement for water for energy by the year 2000 under an assumed high level of energy development is stated to be 28,150 acre feet per year (230). The same estimated amount of water is assumed to apply under the so-called "no action" alternative (224).

In another section, under the discussion of the water reservation application of the DNRG for 1,150,000 acre feet of storage at the Moorehead site on the Powder River, the statement is made:

"The reserved water would be for all beneficial uses. Specific uses are not stated because detailed engineering, economic, and environmental studies are necessary to determine the combination of uses that maximizes benefits from the water and minimizes adverse environmental impacts."

On the other hand, in the original application (9941-r) which is founded on the U.S. Bureau of Reclamation report on the Moorehead unit, the statement is made:

"With the yield of 75,000 acre feet for use in Montana, it can be assumed that a majority of the water will have to be used for purposes that enable high repayment capacity. Essentially, this would mean that the water could have to be marketed for industrial use purposes. Dependent upon the demand for industrial water, it is possible that a high enough price for the industrial water would enable other uses, i.e. municipal, instream, and agriculture, to be subsidized."

Further, in the Bureau of Reclamation 1969 report, the statement is made:

"Moorehead Dam and Reservoir would not be economically justifiable from the standpoint of original purposes only--irrigation, flood control, power,

"fish and wildlife and recreation--but would be economically justifiable if a large part of the conservation storage could be marketed for industrial water purposes, rather than for substantial downstream irrigation."

That same report indicates that under the plan which maximizes benefits in relation to costs, more than 90,000 acre feet per year of the reservoir yield would be allocated to municipal and industrial water uses in Montana and Wyoming (page 17).

Utah notes that justification for the Moorehead Reservoir apparently presumes a much higher level of water use for industrial purposes in the Powder River Basin than does the Department's estimate of water use under a high level of energy development in that basin. It is Utah's view that ultimate use of water for energy purposes in the Powder River Basin will likely be much greater than that indicated in the Draft EIS.

In addition, there appear to be certain typographical or inadvertent errors in the Draft EIS. These are listed in Exhibit "A" attached hereto and by reference incorporated herein.

DATED this 11th day of January, 1976.

UTAH INTERNATIONAL, INC.

By 
Attorney

EXHIBIT "A"

Suggested corrections noted during the course of review of the Draft Environmental Impact Statement on Water Reservation Applications in the Yellowstone River Basin:

Page	Description
2	Second paragraph under "Water Reservation Requests", suggest 1,600,000 ac/y be changed to 1,600,000 acre feet of storage.
31	Map 1-1, add number "4" on map in Big Horn River Basin.
177	First paragraph under section on "Multiple Reservation Requests," change ac/y to acre feet of storage in two places.
253	Last sentence of section on "Impacts-Irrigation Emphasis Alternative" appears to be incomplete.
280	Figure IV-11, change title to read "Powder River Sub-basin Monthly Outflows for 55 Percent of the High Irrigation Emphasis Alternative".
302	Might be moved to follow page 297, and pages 298 thru 301 moved to the end of the section.
305	First sentence under section on "Aqueeducts and Canals," change the word "ready" to "already".
311	In Table V-1, change ac/y to af where it refers solely to storage capacity.
402	Table A-2, should not "Yellowstone Basin Water" be changed to "Yellowstone River Water" to avoid confusion with the pending applications shown in Table V-1 on page 311?

RECEIVED
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 MONT. DEPT. OF NATURAL
 RESOURCES & CONSERVATION

BEFORE THE BOARD OF NATURAL
 RESOURCES AND CONSERVATION OF THE
 STATE OF MONTANA

 IN THE MATTER OF APPLICATIONS FOR)
 RESERVATION OF WATER NO. 1781-I,)
 6294-I, 8476-I, 9442-I, 9646-I,)
 9931-I, 9933-I, 9934-I, 9935-I,)
 9937-I, 9938-I, 9939-I, 9940-I,)
 9941-I, 9942-I, 9943-I, 9944-I,)
 9945-I, 9946-I, 9947-I, 9948-I,)
 9949-I, 9951-I, 9952-I, 9953-I,)
 9954-I, 10,003-I, 10,004-I,)
 10,005-I, 10,006-I)

OBJECTOR, THE MONTANA POWER
 COMPANY'S COMMENTS ON DRAFT
 ENVIRONMENTAL IMPACT
 STATEMENT

As previously indicated in this Objector's consolidated motions, The Montana Power Company received the Draft Environmental Impact Statement on December 23, 1976, after repeated requests to the Department for same. In light of the delay in receiving the Draft EIS we have been unable to adequately review the document. Nonetheless, the following comments concerning same are hereby offered for consideration.

See Comment 42

1. Page 10, paragraph 2 and 3, provides that a model was prepared in order to evaluate impacts. Documentation, references, and description of this model were not provided by the Draft EIS. Such documentation, reference, and explanation should be provided to allow investigation of this procedure to determine its adequacy and accuracy.

See Comment 42

2. Page 13, paragraph 1, states that "large benefits would accrue to water quality, fish and wildlife and recreation values (if the fish and game Commission application was approved). Although very difficult to quantify in dollars, these benefits also have substantial economic value." Similar statements are found in other areas of the document. No attempt has been made to quantify or even define in general terms these economic benefits.

See Comments 42 & 43

3. Page 13, paragraph 4, attempts to establish a cost of an instream flow reservation by defining this cost as the profits foregone by the irrigators denied water to expand. While not stated, the assumption is apparently made that the irrigators could still expand in years when runoff would provide water surplus to the instream flow reservation. The potential stated loss is \$7,700,000. No statement is

made on this page that this figure is per year or for the period 1976 through the year 2000. No consideration is apparently given the very high economic multiplier of irrigated agriculture. While potential loss is derived for irrigation, no such potential loss has been assigned to industrial development that has been foregone, which development also has a high economic multiplier.

See Comment 21

4. Page 13, paragraph 5, notes the need for storage if the Fish and Game requests were granted. It also speculates that energy interests would "probably have to meet the expense of building storage***". The fact that the reservation request is so near the average flow indicates that about 40% of the time sufficient flow would not be available to meet Fish and Game requirements. This being the case, the Department of Fish and Game should logically support the cost of storage in order to meet its requirements in low flow years. This criticism applies equally to the Department of Health and Environmental Sciences' Application and the Draft EIS treatment thereof.

See Comment 162

5. Page 13, under the discussion of the Montana Department of Health and Environmental Sciences' Application, it is implied that if flows are allowed to go below the 6,643,000 acre/feet per year level, a violation of state water quality standards would exist. The Draft EIS nonetheless does not propose how such a flow rate should be guaranteed. A water rights reservation certainly will not alleviate low flow conditions. Only storage could increase these low flow years. Further, the economic justification suffers the same criticisms stated in paragraph 3 above.

See Comment 67

6. Page 15, paragraph 3, notes that the assumption made in the no action alternative is "high level of energy development". Justification for this assumption should be provided.

See Comment 88

7. Page 17, paragraph 5, implies that agriculture is more than an economic interest but, in fact, molds the life-style of the region. It further states, based on the above assumption, that it may prove desirable to reserve a quantity of water to protect and expand agriculture. We are surprised to find that the Department of Natural Resources and Conservation considers life-style molding a beneficial water use.

See Comment 87

8. Page 19, paragraph 8, states that it was "concluded during the course of the environmental impact study that an energy emphasis alternative would, for all practical purposes, be the same as that predicted under the no action alternative." Neither this paragraph nor the main body of the document pertaining to same indicates the basis, documentation, references or analysis which lead to this conclusion.

9. Page 20, paragraph 2, indicates that the instream flow emphasis alternative would "benefit current irrigators, although there may be a cost to future irrigators***". No effort is made in this or other paragraphs on page 20 to assign a cost to foregone industrial development if this alternative is followed. The main body of the document likewise fails to address this economic question.

10. Page 21, paragraph 1, provides that water remaining in the stream provides a public benefit by providing natural flow regimes to maintain, among other items, recreation. Page 9, paragraph 5, states that "a major instream use of Yellowstone water is recreation. Because of the region's sparse population and somewhat limited access to the river, the actual use is much less than the potential." Page 1, paragraph 1, states that a water reservation, when adapted, becomes a water right which may be modified if the reservation's objectives are not being met. From this above discussion, it would appear that (1) recreation is a major benefit used in justifying the large instream flow reservations; (2) due to the lack of access, recreation is much less than the potential; (3) the objective of the water reservation (full potential recreation) must be met or the reservation should be modified. Therefore, access to the river must be increased which in turn will impact riparian ecosystems, water quality, fish and wildlife habitat, and channel form by way of power boat wakes. These impacts have not been analyzed, let alone mentioned, by the Draft EIS. It may be possible that these impacts may substantially offset the benefits of a large instream reservation. Furthermore, it appears from statements made by Ron Holliday, Administrator of the Department of Fish and Game, Recreation and Parks Division, on January 6, 1977, that budget constraints may force closure or reduced services of nearly one-half of the Department's existing recreation areas, state parks and monuments. It would therefore appear that any expansion of recreational facilities may be shelved for an indefinite period.

11. Page 22, paragraph 3, deals with determination of optimal quantities of water to leave in the river. If some methodology was used by the two applicants for large volumes of water, that methodology should be identified. This methodology is likewise not explained or identified in the body of the Draft EIS.

12. Page 23, under the discussion of energy and materials, the statement is made that water developed for energy will help "commit Montana's coal reserves to extraction, and irreversible commitment of a nonrenewable resource, and instream flow applications, on the other hand might reduce the water available for energy development, slowing the growth rate and extending the life time of the basin's coal reserve." If it is the purpose of the Yellowstone Water

Reservations to control energy development or industrial development under the guise of a low profile, esoteric water permit procedure, it should be so stated and a second impact statement should be prepared.

13. Throughout the Draft EIS, but in particular page 97, paragraph 3, and page 49, paragraph 6, seems to use 1970 data. If more recent data is available it should be included along with the reference to identify the source of the data.

See Comment 91

14. Page 107, paragraph 4, uses the five-year 1966-1970 average acre/feet per year flow at Roscoe on the West Rosebud Creek. If more recent data is available it should be included along with the reference to identify the source of the data.

In addition, this paragraph inaccurately states that the annual flow of the West Rosebud Creek is used to generate up to "10 megawatts of electricity". The Montana Power Company facilities at Mystic Lake on the West Rosebud Creek generate up to 11 to 12 megawatts of electricity per hour.

See Comment 86

15. Pages 123 and 124 discuss the state water planning model. If this model is to be the focal point of all water quantity and quality studies, it should be documented and references provided to allow a definition of its primary assumptions. For example, the model apparently does not provide for trends in weather. The fourth paragraph provides that the model assumes that each sub-basin is spatially homogeneous in that it cannot account for variations in physical characteristics or hydrological phenomenon from one place to another in a sub-basin, even though a sub-basin may extend over several counties. A model using such gross data assumptions, unless further discussion of primary assumptions is made, could be of very limited value and certainly not a valid method to establish the data used in a statement of this import.

See Comment 93

16. Page 173, under the discussion of municipal reservation requests, return flow of municipal systems to the river are not analyzed or accounted for. Recent studies have shown in the Billings water system that there is more water returned to the river than taken out. Additional water comes from individual wells throughout the area of Billings and especially in the Billings heights area which receives much of its water from an underground aquifer by way of individual wells.

See Comment 20

17. Page 186, paragraph 1, states that "Although the amounts requested varies from Gardiner to the Clark Fork of the Yellowstone River, the effects of the application would be the same. At Livingston the request is for all stream flow (subject to existing rights) after August 11, which precludes new irrigation after that time even though about 25% crop water needs occur after that time. Further downstream the

request is for the 70th percentile flow; after this level, water would only be available for development for seven years out of ten, on the average." This type of water supply for irrigation would not be feasible to encourage the development of water for agriculture. In the projections that were performed several years ago for development in the Missouri River Basin, a rule of thumb established was that sprinkler irrigation would require at least a seven-year period for the return of investment costs in order to be feasible. If you were to lose the water for the other three years out of a ten-year period, it would not make sprinkler irrigation feasible.

18. Page 192, under the discussion concerning secondary impacts, the statement is made that "granting the Fish and Game Commission's Application would tend to make water unavailable to potential consumptive users." (Emphasis added.) Page 20, paragraph 3, states that not "only would basin ecosystems be protected by this alternative (instream reservation), but water quality and levels would also be maintained. This would benefit current irrigators, although there may be cost to future irrigators in terms of development opportunities foregone." (Emphasis added.) The negative effects of this high instream reservation, mentioned above, both appear to be relatively certain of occurring yet both statements have been conditioned with the word "tend" or "may." On page 23 the statement is made that "An irrefutable commitment of energy and material could indirectly result from the granting of the application for other than instream flow purposes, or from the denying of reservation requests." This statement does not appear to be as certain to occur as effects referenced on pages 20 and 192, yet it is not even qualified to the degree used in the first two statements.

This is a limited example of the instances of bias and distortion contained in the Draft EIS which are used to support the instream reservation at the cost of any other use of the river. These instances of bias impeach the impartialness and scientific validity of the methodology employed to analyze the various alternatives of development.

See Comment 94

19. Page 202, under the discussion concerning the Big Horn River sub-basin, no discussion or information regarding the potential Yellowstone irrigation project is given. This project would permit the irrigation of approximately 42,000 acres. This development would involve the Bureau of Reclamation and the Crow Indian Tribe and other water users on the Big Horn River. Another factor that is not adequately defined or discussed, not only as it would affect the Big Horn River sub-basin, but other interstate streams, is the effect of the Yellowstone River compact between Wyoming, Montana, and North Dakota on the entire environmental study.

See Comment B7

20. Page 289, which concerns the energy emphasis alternative, the statement is made in the first paragraph that the "High level of energy development presented on page 227 is believed to be the maximum, based on current understanding of the many complex constraints involved. Therefore, it is assumed that the energy emphasis alternative would be the same as the projected high level of energy development." Assumptions which must have been made at arriving at this conclusion should be stated. The third paragraph under this alternative states that the energy emphasis alternative "thus becomes identical to the no action alternative...." The assumptions leading to this conclusion should be provided.

Several criticisms should be made of the overall document. This document consistently uses economic and employment material that dates prior to 1970. Current data should have been employed. Further, the Draft EIS is confusing and inartfully drafted. Any lay person wishing to familiarize his or herself with these reservations would most likely be unable to comprehend the scope or importance of this document to the future economic development and environmental protection of the Yellowstone River Basin and tributaries. In addition, throughout this document the economic studies that should have been performed in evaluating the impacts on the human environment if the proposed action was or was not taken, were not conducted. This criticism applies equally to the economic analysis of the energy alternative, as above described.

DATED this 12th day of January, 1977.

By



James F. Walsh
Attorney for The Montana
Power Company, Objecter
40 East Broadway
Butte, MT 59701


I, Tom Smith, do hereby certify that the foregoing was duly served upon the following parties at their addresses this 12th day of January, 1977, by personally delivering to them a true and correct copy of the foregoing.

James M. Driscoll
Hearings Examiner
Department of Natural Resources
and Conservation
32 South Ewing
Helena, MT 59601

Department of Natural Resources
32 South Ewing
Helena, MT 59601

THE MONTANA POWER COMPANY

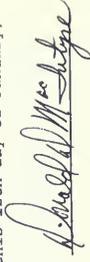

By James D. Smith

Subscribed and sworn to before me this 12th day of January, 1977.


Notary Public for the State of Montana
Residing at Butte, Montana
My Commission expires: 7/26/77

(NOTARIAL SEAL)

I, James D. Smith, representative of The Department of Natural Resources and Conservation, hereby acknowledge personal receipt of the foregoing this 12th day of January, 1977.



STATE OF MONTANA

DEPARTMENT OF

FISH AND GAME

Helena, Montana 59601
January 12, 1977

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MONT. DEPT. OF NATURAL
RESOURCES & CONSERVATION

Mr. Wayne Wetzel, Environmental Coordinator
Department of Natural Resources and Conservation
Helena, Montana 59601

Dear Wayne:

Enclosed are our written comments on the draft environmental impact statement for water reservations in the Yellowstone River basin.

Generally, we believe you have done an admirable job of documenting water resources in the basin and describing the possible impacts on the environment of the requested reservations. We believe you gave considerable thought to effects of streamflow reduction on fish, wildlife and recreation, particularly where suitable data were available. It is unfortunate that sufficient hydrologic data were not available in all portions of the basin, specifically the smaller tributaries in the upper basin, so that a better analysis could have been done there.

Fish and wildlife are handicapped in the economic analyses because dollar values were not assigned to these resource values. This particularly shows up in the estimated loss to potential irrigators of \$7.3 million per year if the Fish and Game reservations were granted in full. Unfortunately, some readers will likely grab on to that figure without reading further as to the very real and important benefits which will accrue from an instream reservation.

Attached are our specific comments on the environmental impact statement. We hope they will be helpful to you in preparing the final EIS.

Sincerely,

James A. Posewitz, Administrator
Environment and Information Division

JAP/LES/gd

Enc

MONTANA DEPARTMENT OF FISH AND GAME
Environment and Information Division

January 12, 1977

Specific Comments by Department of Fish and Game
to Yellowstone Water Reservation Draft EIS

Page 2. Next to last paragraph, last sentence. "...consumptive uses of" should read "...consumptive uses to..."

Page 5, 1st paragraph, Item 1): If priority dates are the same, some mechanism must be implemented to enable everyone to "share the shortage." Item 2): If Fish and Game gets last priority, we will be in a similar position. We are now except we would have some water reserved. However, the "water reserved" is not reserved. Item 3): Unreserved water would allow additional appropriate users to be added. But, the "water reserved" be junior right holders to Fish and Game, they would demand their permits be honored in low water years, causing additional water administration problems. Item 5): Again this might be all right as long as diversionary users "shared the shortage" in low water years.

Page 5. The next to last paragraph, last sentence does not make sense as written.

Page 9, paragraph 3. The period of record used to develop the 1970 level of development should be stated. The Bureau of Reclamation's 1975 depletion study shows that historical flows are 8.8 mmaf. Also the 3.4 mmaf seems wrong. Should it not be 4.2 mmaf (1961)?

Page 9, paragraph 5. What is the potential use of the river? Can this statement stand by itself without substantiating data?

Page 9, paragraph 8. "...warm-water fishery of nonsalmonid species" is redundant.

See Comment 42

Page 13, paragraph 4 & 5. There should be some method to measure the dollar benefits to existing irrigators of maintaining instream flows, such as water quality maintenance and protection of existing diversion structures. What losses would they sustain if these qualities were degraded? Also, \$7.7 million is used here, whereas \$7.3 million is used in the body of the report (page 19).

Page 15. Instream Uses: Admittedly very minimal instream flows were assumed in the ~~Montana~~ Subbasin. However, the "especially, the most productive fishery" implies that the assumed flows are not adequate to maintain this fishery, and thus lends support for a suitable instream flow reservation.

Page 17, paragraphs 1 and 2. The word "would" reduce erosion is used rather than "could." This erosion problem is now being repeatedly addressed, and even in heavily irrigated areas erosion continues to be a problem.

The answer to overgrazed range land is not through irrigation alone. One has to recognize that you merely trade less erosion for more dewatering.

Page 17 (also page 157 and 243). Although waterfowl would benefit from new irrigated areas, the location and type of crop would be important in determining net gains. Irrigated grains would be beneficial, whereas other irrigated crops would not be. Also, pheasants would benefit from new irrigated areas but the benefits would be dependent on availability of adjacent protective cover.

See Comment 95

Page 17, paragraph 2. Lower Yellowstone aquatic impacts should be listed as primary as well as secondary.

Page 22-23. Summary, Part VII. It should be stated that aquatic resources will be committed to an existence at some lower level if instream flows are not granted or if no diversions are granted at all since water would eventually be committed to other uses. (See our comment for page 326.)

Page 47, Map I-4. USCS GCS 06-3245, Powder River at Moorehead is not shown.

Page 54, paragraph 2, second sentence. The statement seems to be overly strong.

Page 54. Quality, paragraph 2. "...quality of its waters...is best at high flow periods." Statement should specify that this quality relates only to TDS and not to such parameters as suspended sediment which lowers water quality.

Page 56. Tables I-7 and I-8. What is data source? See Comments 47 & 60
Page 56, paragraph 1. Statement is not correct. According to Tables I-7 and I-8, aquatic organisms reach their salinity tolerance levels sooner than do plants and therefore tolerances are not similar.

See Comment 96

Page 70, last paragraph, 3rd sentence. Mission and Eightmile creeks should be omitted. Migratory whitefish were found in these streams (Sberg 1975 page 35). Last sentence in this paragraph should be eliminated, since it refers to cutthroat and is in the wrong place.

Page 71, paragraph 5. First sentence should read "Seventy-eight macroinvertebrate species have been identified on the Yellowstone River above the Shields River (Newell 1976)." Sentence is incorrect as written.

Page 74. Plains Zone. First paragraph, 3rd sentence. Should refer only to nonsalme species as being lightly utilized, not to game species.

Page 75. Tongue River. Second sentence change "Popular game fish..." "popular sport fish..." Also, paddlefish were taken in lower Tongue River in the spring of 1975 and 1976, suggesting the possible importance of the Tongue for this species.

Page 76, paragraph 2. Reinhinkle should read Reinhinkel. Also, omit the word "of" from the last sentence referring to sturgeon chub. This species is also found in the Tongue River and lower reaches of the Yellowstone River (Brown 1971).

Page 81, last paragraph. "Bald eagles concentrate along the Yellowstone during spring and fall migrations."

Page 82. Endangered Wildlife. The black-footed ferret may occur in the area, but there have been no recent sightings.

Page 88, paragraph 6. Reference to "some fishing occurs along the Yellowstone...and Tongue rivers." Delete "some." This will strengthen the fishing aspect.

See Comment 97

Page 93. Two Rivers Region, paragraph 1, second sentence. Is paddling the primary recreation followed by hunting, or vice versa? What is data source?

Page 105. Figure I-6. Is the vertical legend correct? See Comment 98

Page 132, Table III-1. City of Billings shows "all beneficial uses" for their request. How can this include fish and wildlife and recreation? See Comment 99

Page 136, paragraphs 2-4 and 6, and page 137, paragraphs 1-3 and page 138. The conservation district application summaries should provide adequate maps to present proposed diversion locations. There are no figures provided showing potential diversion amounts. There are no times indicated when diversion will occur. This does not provide for adequate evaluation of impacts on aquatic resources. It is stated on page 2 that the evaluation would be minor. We believe that may be true on the upper river, given storage facilities that store other than during high water periods.

See Comment 100

Page 154, paragraph 1. Even though return flows may be diluted by larger streams, it appears there could be some adverse local effects of return flows before those flows reach the larger streams. Example: Shields River and tributaries which already suffer from dewatering and which could be affected by return flows before those flows reach the main Yellowstone River.

Page 154. Secondary Impacts, paragraph 3. The first sentence would appear true only if new storage is not required. New storage might make some projects have a poor benefit:cost ratio, making them not economically feasible to irrigators alone.

Page 157, paragraph 5. Last sentence should read: Further (or more frequent) dewatering may terminate spring and fall spawning as well as reduce the resident species of these five streams.

Page 158. Carbon Conservation District, paragraph 2. Operation of Gooney Reservoir to maintain minimum instream flows would only benefit Rock Creek below its confluence with Red Lodge Creek. Many miles of Rock Creek upstream would be unaffected by this operation and would continue to suffer from low flows.

Page 158. Rosebud Conservation District, paragraph 1, last sentence. It is doubtful that different species than already occur in Tongue River Reservoir would occur by raising Tongue River dam.

Page 158, paragraph 1, second and third sentences should read: "On the other hand, trout populations in tributaries to the Shields River appear to have stable age class structures providing substantial recruitment of fish to the Shields River and that they are important in maintaining mainstem populations..."

Page 158, paragraph 1, last sentence. Add to end of sentence "... unless adequate instream flows are provided during this period."

Pages 173 and 177. The Billings application is not quantified as to duration, frequency or time of diversion. This is essential to evaluate impacts. This would have important implications to other potential users.

Page 178. Quantification of conservation district instream flow requests is necessary. Consider alternative alternatives and also the direct impact of the conservation district request.

Page 180. Map III-5. Fish and Game did not request flows in Bighorn Reservoir as shown, but did request flows in the Bighorn River below the reservoir which is not shown.

Page 183. Maps 5a and 5b. Dotted lines on maps are roads and should be noted as such to avoid confusion.

Page 192. It is indicated in paragraphs 2 and 3 that the only water requested is the dominant discharge for a single, unspecified 24-hour period. The dominant discharge concept assumes, although numbers are not presented, except where discharge data are available, that in May or June a peak flow (dominant discharge) is requested, followed by a period of August (see page 15, 30, 62 and 63 of the Department of Fish and Game's request). The intent of the reservation was to provide flow "numbers" where possible during the high flow period. Due to lack of streamflow data, many of the tributaries do not have flows on the ascending and descending stages of the spring hydrograph.

Page 192 under "secondary impacts." The comment that granting the Fish and Game Commission's application would tend to make water unavailable to potential consumptive users is false in years of average or above average flow. It would impose water retention facilities for dry years; however, withdrawal for storage may be sporadic as flows fluctuate.

Page 193, paragraph 1. It would be beneficial to quantify the benefits to current consumptive water users of maintaining instream flows and would help offset the estimated \$7.3 million (or is it \$7.7 million) annually foregone to agriculture from granting the instream requests.

Page 193, paragraph 3. There should be a listing of annual monetary losses to irrigators based on the water planning model's predictions ranging from 0% to 100% of Fish and Game recommendations, rather than just using the 100% profits foregone figure of \$7.3 million. This might allow a more rational decision on instream water allocations to be made.

Page 193, paragraph 6. Has the cost of storage facilities been used to evaluate benefits? For example, on page 137, one project 20 miles north of Gardiner would potentially utilize water from five storage sites. Is one storage site needed or do we need all five constructed to fit water demands? When evaluating cost benefits, many other considerations are necessary:

(1) If water quality deteriorates, what would be the net loss to downstream irrigators? (See page 193 and 257.) Page 263 shows possible TDS values which indicate problems in the mid-Yellowstone subbasin at various flow levels during low flow periods. TDS could theoretically reach near 1000 in August.

(2) What would be increased diversionary cost to downstream irrigators under various levels of development?

(3) Losses to recreational pursuits and businesses are not shown or discussed. See Comment 42.

(4) Ditch rider costs would also have to be assumed.

We suggest a better economic analysis which would include at least the areas above.

Page 196, paragraph 1, third sentence. The 70 percentile flow was used at Livingston as well as further downstream. (See Fish and Game reservation application, page 78.)

Page 197. Figure III-5. Figure does not present a true picture of the upper part of the Yellowstone where "instantaneous flows..." have been requested by Fish and Game. In this case there would be no surplus water between August-May if the request is granted.

Page 198, paragraphs 4 and 5. The question of the expense of irrigation facilities is again discussed. The implication is that irrigators with or without the instream flow request cannot afford to construct dams. If this is true, is it reasonable to assume they will be unable to irrigate more land in these drainages? It appears too much emphasis is placed on the Fish and Game reservation precluding developing of additional irrigation, since "without additional water storage, few of these streams could support much more new irrigation" anyway.

Concerning the passing of a dominant discharge flow, the concept of an overface spillway without outlet structure could be used in conjunction with gates to pass the dominant discharge. Aren't most dams on smaller rivers capable of passing a bank-flood? Cost considerations are not addressed in this question. It is possible that passing the 24-hour dominant discharge would be a major problem and that this would be the primary factor as to whether a dam can or cannot be afforded.

Page 197 and page 198, paragraph 2. If on the average a good water supply is necessary about 8 years out of 10, then why does the figure depicting upper Yellowstone monthly surpluses show only the surplus to instream requests for low flows occurring only once every 10 years?

See Comment 102

On page 199, Table III-25 uses the 80th percentile figure. There should be some explanation as to why 80 percentile is used in one place and the 90th percentile in another. Also, a description of how the 90 percentile flows were derived and their degree of reliability should be noted, particularly since they reflect Fish and Game's requests in a bad light in many cases, when in fact the requests are conservative. No reference to methods, accuracy or reliability are given anywhere in the report, and streamflow records are poor or nonexistent on most of these small streams.

See Comment 103

Page 202. Table III-27. Same comments as for Table III-25. For example, Rock Creek June discharge appears incorrect, since this is the peak flow month and the 80 percentile flow figure given does not depict this in reality.

See Comment 103

Page 204. Tongue Subbasin. Three tributaries (Hanging Woman, Otter and Pumpkin creeks all have greatly fluctuating discharge patterns which surely preclude any major irrigation development with or without an instream reservation. The same statement that was made about Rosebud Creek should be made about these three tributaries (see page 203).

Page 204. Powder Subbasin. Same comment as for Tongue Subbasin.

The continued undercurrent that there is a great conflict between instream requests and irrigation goes throughout the entire statement. This may be true on the mainstem, but is certainly not true on the tributaries (Tongue and Powder), since in many places in the EIS it is stated that enough firm water for any future development in these basins is not existent without additional storage. Thus how can instream flows be in conflict with irrigation? Existing rights are guaranteed and cannot be harmed by a reservation.

Page 209. Same comment as given for page 193, paragraphs 3 and 6, except additionally the advantages of maintaining existing water quality should be estimated in dollars with some dollar loss projected if water quality is lowered due to future diversions.

Page 209, paragraph 2. Last sentence could be broadened by stating that if the channel form is not maintained then river habitats and ecosystems would undergo some changes.

Page 214. There should also be a listing of those tributaries where no conflict exists over instream/consumptive uses. Otherwise the reader may be lured into believing that conflicts exist in all tributaries.

Page 227. Last paragraph. Appendix number was omitted.

Page 232, paragraphs 2 and 3. The cost of storage is not discussed here. Does project feasibility include storage costs? See Comment 104

Page 233. Table IV-5. Footnote 2 should give page number where criteria are found.

Page 237. Map IV-1 of irrigated and irrigable land does not show irrigation on the Powder in Prairie County. Also shows no irrigation on the Little Powder, while Table 1-26 indicates 6,785 acres.

Page 241, paragraph 1. The earlier filing by Fish and Game would not protect the status quo of the blue ribbon reach. This filing also does not provide sufficient high-priority filing. This filing also thus filing of the "blue ribbon" reach but also extends date to the north-south Carbon-Stillwater county line. The "blue ribbon" reach ends at Big Timber.

Page 241 and 245. As admitted in the report, the 90 percentile low flows of 45 and 15 cfs are not considered adequate for fishery purposes. Any project to store water on the Tongue River could not be considered multi-purpose if only these flows were guaranteed.

Page 242, paragraph 5 and page 244, paragraph 1. Impacts on the upper and middle river could be severe if energy industries moved their requests to upper portions of the basin. Also, to the end of this paragraph, add "and the lower Yellowstone subbasin approximately 1 year in 10."

Page 243, paragraph 2. Same as our comment for page 17.

Page 247, paragraph 4. There is also a heron rookery and an osprey nest at the head of Tongue River reservoir.

Page 257, paragraph 2, first sentence. The statement that temperature in the mainstem will not be a problem appears too strong. As flows decrease given the same solar input, temperatures will rise. Temperature increases coupled with higher TDS levels and potentially lower dissolved oxygen levels can cause problems for aquatic life. Even if water temperatures rose only 1-2 F there could be certain instances when existing temperatures are already high that the additional temperature increase would violate state water quality standards.

See Comment 105

Page 258, paragraph 2. After last sentence add "However, Kinsey Irrigation District's pump No. 1 requires a minimum of 4,000 cfs to efficiently operate."

See Comment 106

Page 259. Recreation and Aesthetics. It should be stated that recreation and aesthetics would be significantly degraded rather than simply stating they will "change significantly."

Page 259, paragraph 3. It is logical to assume energy development will occur where adequate water supplies remain. It should not be assumed that energy development will take place only where strippable coal reserves lie. It is theoretically possible for them to also locate in the upper river basin.

Page 265. Secondary Impacts. Paragraph 1. However, this level of development may increase the frequency of flows in August, making it more difficult for existing users to get their water.

Page 265. Tongue Subbasin: Primary Impacts. Streamflow Alterations, paragraph 2. Why will flows be "near zero in February, November and December" (the period of no irrigation)? Is this due to storage for summer irrigation?

Page 283, paragraph 2. The sturgeon chub is not "Montana's rarest fish." However, it is a rare fish in Montana.

Page 305. Irrigation Water Management, paragraph 3. Although waste water may be beneficial to augment late season streamflows, the excessively reduced summer flows needed to supply this water may offset any advantages of the late season flows. Water temperatures are higher in mid-summer than in late season and low flows have more impact during these hot periods than in cooler periods. Thus improved water management might benefit fishery resources where low summer flows currently exist on a regular basis.

Page 327. WATER. Paragraph 3. We do not necessarily agree with the last sentence. As more and more demands are placed on water resources, political actions at any future time would likely affect any instream reservations held by Fish and Game. Even though the Board, under present law, must show that the purpose of the reservation was not being met before it could be modified or revoked, we will be in a constant position of defending an instream reservation and perhaps even quantifying that reservation in more precise terms. Thus this sentence gives the impression that the state of Montana will be "locked in" to any instream reservation obtained. This may not necessarily be the case in future years.

Page 328. Aquatic Communities and OTHER. A more precise statement should say that not granting instream flow requests in either the requested amounts or not at all will commit fish, wildlife and recreational resources to a lower future level of existence than presently occurs, and this lower level will be irretrievable.

Page 401, Table A-1. Fish and Game fillings include not only the "blue ribbon" reach but also go beyond that reach downstream. Boulder River is lowermost point of the "blue ribbon" reach. Also the footnote (source:) appears to be an incomplete sentence.

Appendix. Map A-4 is not correct. Pronghorn distribution is too widespread. It appears the shaded and unshaded areas should be reversed.

REVIEW COMMENTS
ON
DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR

YELLOWSTONE WATER RESERVATION APPLICATIONS

RECEIVED

JAN 12 1977

SUBMITTED BY:

PARK, SWEET GRASS, STILLWATER, CARBON, YELLOWSTONE, BIG HORN
TREASURE, ROSEBUD, NORTH CUSTER, POWDER RIVER, PRAIRIE COUNTY,
DARSON COUNTY AND RICHLAND COUNTY CONSERVATION DISTRICTS

DATED:

JANUARY 12, 1977

REVIEW COMMENTS
ON
DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR
YELLOWSTONE WATER RESERVATION APPLICATIONS

Introduction

Hurlbut, Kersich & McCullough has reviewed this statement in some detail and offers the following written comments. In general, the Environmental Impact Statement is well prepared and organized, although with most EIS's it is extensive and lengthy. There are certain areas where opinion and conjecture replace fact, and there are issues that were not discussed in the detail that they should be. These and other comments are listed on a page by page basis following:

Specific Comments

Page 2 - Last Paragraph.

Mention is made of the State Water Plan and Reservations effecting this Plan. Would it not be more logical to complete the State Water Plan before final decisions are made on Reservation requests? This approach is insinuated in this paragraph and we support it.

Page 3 - Table 1.

Several of the numbers do not agree with our copies of Conservation District applications. Corrections are shown on the enclosed xerox copy.
See Comment 109

Page 4 - Table 1

The City of Billings request is totally unreasonable as insinuated later in the report.
See pp. 3-8; City of Billings Response

Page 6 - Second Paragraph.

We believe, that implementation and control of water reservations, particularly instream flow reservations, will be difficult if not impossible to administer. Control will once again be at a County level and central knowledge of water rights status will be unlikely. The Yellowstone River flows vary considerably from day to day and an extensive measurement system would be necessary before a new user could divert water, particularly if instream flow minimums are granted. We would like to see a section on just how reservations would be administered and how the Permit System would compare.
See Comment 110

Page 11 - First Paragraph.

This farm budget analysis is conservatively high and benefits will not always exceed costs in all cases with today's market. However, this conservatism was left in as a hedge against the unknowns of future market conditions. This should be explained as the economics will be challenged.
See Comments 111 & 112

Page 16 and 17.

It is our understanding that the EIS was prepared to examine the impact of Reservation applications. But here the State's own study was used completely ignoring the applicants' more extensive study. The results of these two studies differ considerably, (i.e., Clark's Fork Sub-Basin acreage) and an effort should be made to determine why they differ. We feel that the applications as received should be considered.
See Comment 112

The positive effects of single channel morphology are conspicuously lacking. Mention should be given to improved soil conservation, stream bank stability, reduced silt load, etc.

Page 52, Table I-5.

Lake Wolvoord is misspelled. Also, Lake Adam and Wolvoord are more commonly known as Upper and Lower Glasston Reservoirs, respectively.

Page 53

Mention should be given to the numerous control reservoirs in Wyoming as they effect the Big Horn and Tongue Rivers. At a minimum, Wyoming's claim to compact allocations should be placed into the Impact Analysis. A substantial amount of Yellowstone Water originates in Wyoming.

See Comment 64

Page 55

Water quality for irrigation is an important consideration, particularly in the Tongue and Power Rivers. Yet it is brushed over lightly throughout this statement. As explained in the text, Total Dissolved Solids, is not a good indicator. We would like to see a more extensive analysis.

See Comment 113

Page 61 and 63

This Table should be called "Existing Vegetation Types" as many varieties are introduced and not "Natural".

These Tables indicate a net depletion of 2.8 acre feet per acre. Judging from studies that we have performed and review of other studies, this value is very high. We believe, that a depletion of 2 AF/A would be more valid on an annual basis. The SCS commonly recommends that total depletion is estimated to be 120% to 130% of the irrigation depletion which basin wide is no more than 1.6 AF/A. We feel that the value of 2.8 AF/A should be substantiated.

See Comment 2

Page 117 and 118

No discussion is given to the Yellowstone River effects on Water Reservations and Wyoming's future use of water. This element can not be ignored.

See Comment 64

Page 124 - Fifth Paragraph.

This water planning model is not well suited to analyzing environmental effects as well stated in this paragraph. We agree and emphasize this point.

See Comments 86 & 114

Page 131 - Table III - 1

Errors as noted previously.

Page 136 - Third Paragraph.

Again, this farm budget analysis was not intended to be indicative of present day economics but flexible so as not to preclude future irrigation development allowed by market changes.

Page 157 - Last Paragraph.

No consideration is given to the possibility of reservoirs providing instream flows during critical times. When the operation studies were performed, we provided for instream values as part of determining the available water supply. We disagree with the statement that implementation of the Reservation request would aggravate dewatering in late summer and fall. The exact opposite could just as easily be the case. See Comment 115

Page 158 - Sweetgrass Conservation District.

Apparently there is a misunderstanding as to determination of instream flows. This paragraph implies that instream flows would be held to 10% of average flows on a continuous basis. This is not the case as minimum flows often exceed this value. We used the recommendations of Mr. D. L. Tennant, Fish and Wildlife Biologist, of which a copy is enclosed and we feel this approach along with the permit system to be much more workable than instream reservations. See pp. 4-5 of FG's Response & Comment 116

Page 159, 160, etc.

As mentioned previously, these hydrographs do not reflect the positive effects of reservoir storage in August and September. Also, due to lagging return flows from irrigation, I suspect that hydrograph of average flows will increase, not decrease in the fall and winter months. See Comment 117

Page 192

It is our feeling that granting of the Fish and Game or Department of Health and Environmental Sciences request would totally preclude irrigation development. Future irrigation will be progressively more costly and maximum yields are a necessity to allow

an adequate return on investment. A partial water supply will not be acceptable.

Page 231 - First Paragraph.

Gross evapotranspiration requirements of crops in this area would come closer to 25 inches than 20 inches. See Comment 118

Page 241 - Second Paragraph.

What effects have historical low flows had upon the aquatic environment? Apparently, these naturally occurring conditions haven't eliminated the species. It appears that the Fish and Game request is closer to utopian conditions than acceptable conditions. At any rate, this EIS still leaves unanswered the question of what is an acceptable instream flow regimen. See p. 5 of FG's Response & Comment 119

Page 242 - Fourth and Fifth Paragraphs.

We agree strongly with these paragraphs as these thoughts are in direct contradiction to the Fish and Game application claims. See p. 5 of FG's Response

Page 243 - 252.

These impacts as stated need to be supported by facts and contain less conjecture. See Comment 120

Water quality on the Powder River is directly associated with flows, better with high flows, degraded with low flows. A reservoir may improve the overall quality of the water but it appears that this quality may not be suitable for irrigation, whereas high flow diversions are suitable. (Water spreading). This is a definite impact that should be discussed.

See Comment 121

Extremely low or zero flows already exist naturally on the Powder River. Thus, if anything, low flows in lieu of zero flows are a positive impact.

General Comments

OO The impacts of lesser incremental instream flows were not considered while lesser incremental irrigation and energy requests were. We feel that lesser incremental instream flows should be examined in all fairness and from a practical standpoint. It seems illogical that such high flows must be reserved knowing that the aquatic environment has accommodated the historical low flows of the Yellowstone River. We feel that viewpoints other than the Fish and Game should be solicited. See P. 5 of FG's Response & Comment 122

Also, no discussion or consideration is given to the possibility of diverting water near the mouth of the stream or river after it has served it's instream values. The format of the Fish and Game or Department of Health and Environmental Sciences would preclude this option.

See Comment 123

It has been our contention that sufficient water exists to satisfy future irrigation and industrial requirements in the Yellowstone River Basin. The time of withdrawal and place of withdrawal are far more critical than supply as partially brought out in the EIS. Will Reservations solve this problem as well as policy controlled permits? Will Reservations preclude energy and agriculture working together to develop water?

We do not believe total conservation of resources is in the best interest of Montana or the nation. Montanan's have to make a living in Montana to enjoy it's benefits. Who is going to pay the price for a free flowing river with a utopian environment for aquatic and riparian ecosystems.

See p. 5 of FG's Response & Comment 124

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MONTANA WATER LAW AND AQUATIC RESOURCE PROBLEMS
 AND RECOGNIZED SOLUTIONS

TABLE 1
 APPLICATIONS FOR RESERVATIONS OF WATER IN YELLOWSTONE BASIN

Applicant	Source	Amount	Use
Park Conservation District	Yellowstone & Shields River	752 cfs/108,143 acre feet per year (af/y)	Irrigation (36,570 acres) ✓
Sweet Grass Conservation District	Yellowstone River, Snake River, & various tributaries	438.7 cfs/55,822 af/y	Irrigation (18,510 acres) ✓
Stillwater Conservation District	Yellowstone River & Stillwater River	133.3 14,544 122.1 cfs/16,755 af/y	Irrigation (5,200 acres) ✓ 5,777
Carbon Conservation District	Yellowstone River, Clarks Fork, Rock Creek, & Red Lodge Creek	274.2 cfs/47,557 af/y	Irrigation (21,015 acres) ✓
Yellowstone Conservation District	Yellowstone River	415.0 63,894 378.2 cfs/62,900 af/y	Irrigation (26,785 acres) ✓
Big Horn Conservation District	Big Horn River, Tongue River	1513cfs/21,200 af/y 158.6	Irrigation (9,645 acres) ✓
Treasure Conservation District	Yellowstone & Big Horn Rivers, Snake & Tongue Creeks	129 cfs/19,978 af/y	Irrigation (7,645 acres) ✓
Rosebud Conservation District	Yellowstone, Tongue Rivers, Arnel's & Rosebud Creeks	585 cfs/94,129 af/y	Irrigation (37,360 acres) ✓
North Guste Conservation District	Yellowstone River, Tongue River & various tributaries	732.4 cfs/104,237 af/y	Irrigation (36,965 acres) ✓
Powder River Conservation District	Powder River, Tongue River, & various tributaries	583.2 cfs/83,060 af/y	Irrigation (30,245 acres) ✓
Prairie County Conservation District	Yellowstone River	512.9 cfs/63,127 af/y	Irrigation (20,646 acres) ✓
Dawson County Conservation District	Yellowstone River	325 cfs/45,149 af/y	Irrigation (17,687 acres) ✓
Richland County Conservation District	Yellowstone River	354.2 cfs/45,620 af/y	Irrigation (21,770 acres) ✓ 25,012 B ²

BY

D.L. TENNANT
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INTRODUCTION

NATURAL, FREE-FLOWING STREAMS ARE ONE OF THE WORLD'S MOST BEAUTIFUL AND VALUABLE RESOURCES. BEFORE THE COMING OF CHRIST, THE POPEAN EMPEROR JUSTINIAN SAID: "BY THE LAW OF NATURE CERTAIN THINGS ARE COMMON PROPERTY; FOR EXAMPLE, THE AIR, RUNNING WATER, AND THE SEA." AMERICA'S LATE SENATOR MORRIS SAID: "THE STREAMS THAT ARE FLOWING DOWNHILL WERE GIVEN US BY A CREATOR, THEY DO NOT BELONG TO ANY SPECIAL INTEREST OR TO ANY INDIVIDUAL, THEY BELONG TO THE PEOPLE AND OUGHT TO BE UTILIZED FOR THE BENEFIT OF ALL OF THEM."

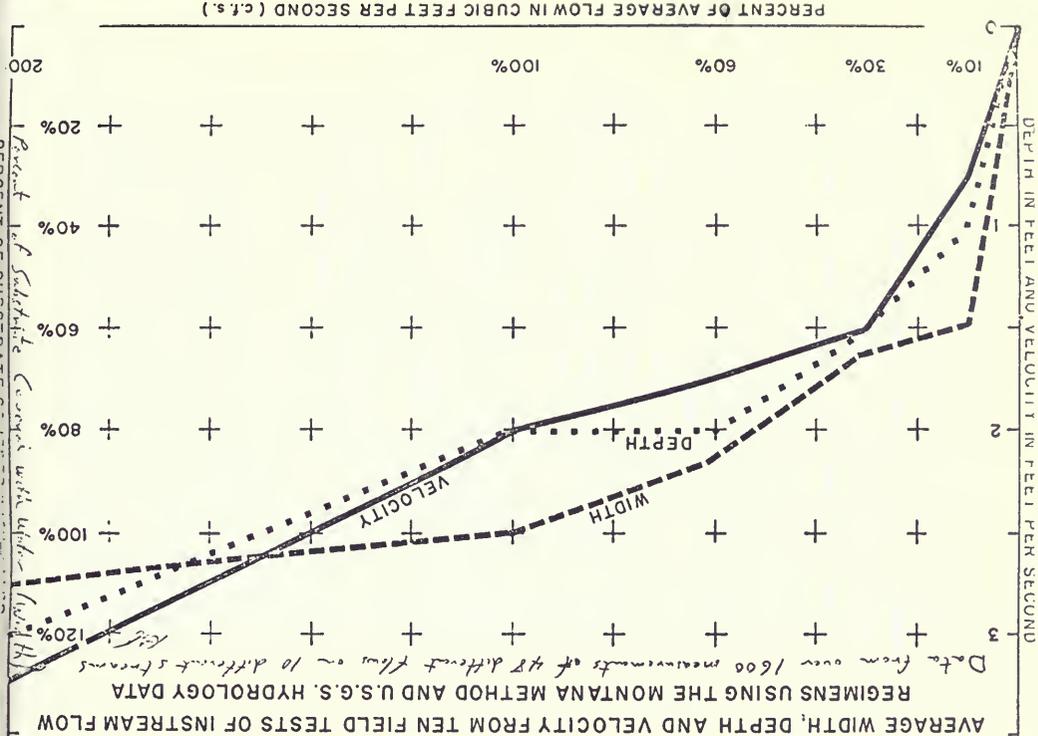
ISN'T IT IRONIC THAT THE THESIS THAT FLOWING STREAMS BELONG TO EVERYONE HAS BEEN RECOGNIZED FOR SO LONG BY SUCH INFLUENTIAL PEOPLE AND YET THAT PROBLEM IS STILL WITH US.

FEW STREAMS IN THE UNITED STATES HAVE ESCAPED DEGRADATION FROM ALTERED FLOWS BY SOME KIND OF MAN-MADE, "WATER DEVELOPMENT" PROJECT, ONLY RECENTLY HAS RECOGNITION BEEN GIVEN TO INSTREAM FLOW REGIMENS TO PROTECT THE NATURAL ENVIRONMENT. SCIENTISTS FROM MANY DISCIPLINES ARE NOW SEEKING RELIABLE, PRACTICAL METHODS FOR DETERMINING STREAMFLOW REQUIREMENTS TO PROTECT FISHES, WATERFOWL, FURBEARERS, REPTILES,

AMPHIBIANS, MOLLUSKS, AQUATIC INVERTEBRATES, AND RELATED LIFE FORMS FROM ALL THE VARIOUS PEOPLE COMPETING FOR OUR PATTON'S WATER.

WIDTH, DEPTH, AND VELOCITY ARE PHYSICAL INSTREAM FLOW PARAMETERS VITAL TO THE WELL-BEING OF AQUATIC ORGANISMS AND THEIR HABITAT. THE LACK OF SPECIFIC KNOWLEDGE AS TO JUST HOW THESE FACTORS EFFECT DIFFERENT ORGANISMS IS A MAJOR PROBLEM. SIXTEEN-HUNDRED MEASUREMENTS OF THESE PARAMETERS FOR 48 DIFFERENT FLOWS ON 10 STREAMS THAT I HAVE STUDIED SHOW THAT THEY ALL INCREASE WITH FLOW AND THAT CHANGES ARE MUCH GREATER AT THE LOWER LEVELS OF FLOW (FIG. 1). WIDTH, DEPTH, AND VELOCITY ALL CHANGED MORE RAPIDLY FROM NO FLOW TO A FLOW OF 10% OF THE AVERAGE, THAN AT ANY POINT THEREAFTER. TEN PERCENT (10%) OF THE AVERAGE FLOW COVERED 60% OF THE SUBSTRATES, DEPTH AVERAGED 1 FOOT, AND VELOCITIES AVERAGED 3/4 FOOT PER SECOND. STUDIES SHOW THAT THESE ARE CRITICAL POINTS OR NEAR THE LOWER LIMITS FOR THE WELL-BEING OF MANY AQUATIC ORGANISMS, PARTICULARLY FISHES. THIS SUBSTANTIATES THE CONCLUSION THAT THIS IS THE AREA OF MOST SEVERE DEGRADATION OR THAT 10% OF THE AVERAGE IS A MINIMUM SHORT-TERM SURVIVAL FLOW AT BEST. FLOWS FROM 30% TO 100% OF AVERAGE RESULTED IN A GAIN OF 40% FOR WETTED SUBSTRATE, AVERAGE DEPTH INCREASES FROM 1 1/2 TO 2 FEET, AND AVERAGE VELOCITIES RISE FROM 1 1/2 TO 2 FEET PER SECOND. THESE ARE WITHIN GOOD TO OPTIMUM RANGES FOR AQUATIC ORGANISMS, HOWEVER, IT REQUIRES 3 TO 10 TIMES THE AMOUNT OF WATER NEEDED FOR A SHORT-TERM MINIMUM OR GOOD BASE FLOW, AND GAINS OR BENEFIT-COST RATIOS MAY BECOME QUESTIONABLE. INCREASING FLOW FROM 100% OF AVERAGE TO 200% OF AVERAGE (DOUBLED) ONLY INCREASES AVERAGE WETTED SUBSTRATE BY 10%, AVERAGE DEPTH INCREASES FROM 2 TO 3 FEET, AND AVERAGE VELOCITY

FIG. 1
AVERAGE WIDTH, DEPTH AND VELOCITY FROM TEN FIELD TESTS OF INSTREAM FLOW REGIMENS USING THE MONTANA METHOD AND U.S.G.S. HYDROLOGY DATA



Percent of Substrate Covered with Wetted (Mont. Mth.)

20%

40%

60%

80%

100%

120%

200

10%

30%

60%

100%

POWER OPERATIONS BELOW MANY DAYS ARE SYMBOLIC OF THIS TYPE OPERATION. QUARTERLY VARIATIONS IN FLOW REGIMENS MIGHT APPROXIMATE CLIPATIC HYDROLOGY AND BE APPROPRIATE. I USUALLY RECOMMEND VARIATION IN FLOW REGIMENS FOR 6-MONTH PERIODS THAT MIMIC NATURE AND COINCIDE MOST NATURALLY WITH THE SO-CALLED CLIMATIC YEAR USED BY THE U.S.G.S. AND THE U.S. NATIONAL WEATHER SERVICE. THIS OFFERS THE FOLLOWING DISTINCT ADVANTAGES: 1) STAGES OF GROUND WATER ARE MORE NEARLY UNIFORM ON OCTOBER 1 IN MOST INLAND SECTIONS OF THE UNITED STATES THAN ON ANY OTHER DATE, LEADING IN GENERAL TO FAIRLY RELIABLE COMPARISONS OF ANNUAL RAINFALL-RUNOFF RELATIONS BECAUSE OF THE RELATIVELY SMALL ERRORS DUE TO ANNUAL DIFFERENCES IN THE GROUND-WATER TABLE ON THAT DATE; 2) IN THE ARID AND SEMI-ARID PARTS OF THE COUNTRY, SEPTEMBER 30 USUALLY MARKS THE END OF THE IRRIGATION SEASON AND IN HUMID REGIONS IT APPROXIMATES THE END OF THE GROWING SEASON; 3) THERE IS A MINIMUM PROBABLE ERROR DUE TO THE EFFECT OF ICE IN THE RECORDS OF WINTER FLOW IF THE DISCHARGE FOR THE WINTER PERIOD (NOVEMBER TO APRIL) IS COMPUTED TOGETHER AT ONE TIME; 4) THE WINTER OR BASE FLOW PERIOD COINCIDES WITH REDUCED METABOLIC FUNCTIONS AND DECREASED DEMANDS FOR VITAL LIFE ELEMENTS BY MOST AQUATIC ORGANISMS (E.G., OXYGEN, FOOD, REMOVAL OF WASTE PRODUCTS, AND INCREASED TOLERANCE TO POLLUTION); 5) A LOW FLOW WINTER PERIOD MATCHES THE DOWNSTREAM MIGRATION HABITS OF MANY FISHES (WARMWATER AND COLDWATER), WHEN THEY TRAVEL TO DEEPER MORE PERMANENT WATER TO SPEND THE WINTER. THIS IS ALSO THE SPAWNING AND INCUBATION SEASON FOR MOST SALMONIDS, WHEN THEY NATURALLY SEEK LESS WATER BY MOVING INTO HEADWATER OR TRIBUTARY STREAMS AND CUTO REDDS IN SHOAL OR SHALLOW RIFLE AREAS;

RISES FROM 2 TO 3½ FEET PER SECOND. VELOCITIES AVERAGING 3½ FEET PER SECOND ARE PROBABLY TOO HIGH FOR THE GENERAL WELL-BEING OF MOST AQUATIC ORGANISMS BUT GOOD FOR MOVING SEDIMENT, BEDLOAD, AND WHITE WATER BOATING. IN ALL FIELD TESTS OF STREAM FLOW I STUDIED, WATER DEPTH APPEARED ADEQUATE FOR AQUATIC ORGANISMS WHENEVER VELOCITIES WERE SATISFACTORY. ANOTHER PROBLEM THAT CONCERNS ME IS PEOPLE USING 7-DAY OR 3-DAY MINIMUM, OR HISTORIC MINIMUM FLOW CRITERIA AS A BASIS FOR RECOMMENDING FLOW TO PROTECT FISH, WILDLIFE, OR THE RELATED AQUATIC ENVIRONMENT. IN 1970, I EVALUATED 7-DAY MINIMUM FLOW CRITERIA INPUT FOR THE UPPER MISSOURI, YELLOWSTONE, KANSAS, AND PLATTE-TERRARA SUB-BASINS OF THE MISSOURI RIVER BASIN COMPREHENSIVE STUDY. I FOUND THAT THESE CRITERIA RESULTED IN ZERO FLOW IN 86 OF 305 INSTANCES, OR ABOUT 28% OF THE TIME. IN 236 OF 305 CASES (77%), THE 7-DAY MINIMUM FLOW WAS LESS THAN 10% OF THE AVERAGE FLOW, WHICH I CONSIDER IN THE RANGE OF SEVERE DEGRADATION FOR MOST ELEMENTS OF THE AQUATIC ENVIRONMENT. CRITERIA FOR 3-DAY MINIMUM FLOWS WOULD BE WORSE YET, AND RECOMMENDING THE NEARER, ALL-TIME, HISTORIC MINIMUM FLOW WOULD BE UNTHINKABLE. THAT WOULD BE LIKE PRESCRIBING A PERSON'S ALL-TIME WORST HEALTH CONDITION AS A RECOMMENDED LEVEL FOR A PORTION OF HIS FUTURE WELL-BEING. I WOULD SUGGEST THAT WE AVOID RECOMMENDING VACILLATING FLOW REGIMENS SPECIFICALLY FOR FISHES, OR ANY OTHER SINGLE PURPOSE COINCIDENTAL WITH MONTHLY (M.A.F.) OR DAILY (D.A.F.) AVERAGE FLOWS BECAUSE THERE ARE TOO MANY UNKNOWN, DEGRADING EFFECTS ON THE LIFE CYCLES OF MANY OTHER ORGANISMS IN THE AQUATIC ENVIRONMENT AND OTHER USES OF WATER TO JUSTIFY FREQUENT EBB AND FLOW CHANGES IN MOST STREAMS. PEAKING

HIGHER SUMMER FLOW REGIMENS COINCIDE WITH THE FROST-FREE, GROWTH PERIOD FOR MOST AQUATIC PLANTS AND ANIMALS, WHEN THEIR REQUIREMENTS FOR DISSOLVED GASES, SPACE, FOOD, AND REMOVAL OF SEPTIC WASTE PRODUCTS ARE NATURALLY HIGHER THAN AT OTHER TIMES. DEPTH, AND VELOCITIES IN THE STREAM ARE TO ENHANCE THE AVAILABILITY OF ELEMENTS VITAL TO THESE FUNCTIONS (SEE CRITICAL LIFE FUNCTIONS). THESE PHENOMENA MAY BE REVERSED FOR ANADROMOUS FISHES USING THE COASTAL STREAMS OF THE CANADIAN PROVINCES, AND OUR WEST COAST STATES OR SOME STATES (CUMBERLAND RIVER) AND FLOW REGIMENS SHOULD BE ADJUSTED ACCORDINGLY.

RECOMMENDATIONS ARE NEVER ADOPTED, SINCE PROVIDING FISH, WILDLIFE, AND ENVIRONMENTAL PRESERVATION OR PROTECTION IS NOT A LEGAL BENEFICIAL USE OF WATER IN MOST OF THE WESTERN STATES.⁹ ADMINISTRATORS MANAGING DEVELOPMENT PROJECTS ARE GENERALLY WILLING TO REGULATE FLOW TO PROTECT THESE RESOURCES AND PROVIDE MINIMUM FLOWS NECESSARY TO PROTECT THESE RESOURCES WHEN THERE IS PLenty OF WATER. THESE RESOURCES ARE THE FIRST TO SUFFER WHEN WATER IS SHORT.^{3, 21, 25, 27}

PROJECT MANAGERS OF THE U.S. BUREAU OF RECLAMATION, CIVIL ENGINEERS, AND THE MONTANA POWER COMPANY WERE REQUESTED TO PROVIDE MINIMUM FLOWS THAT THEY RECOGNIZED SOLELY FOR THE FISH, WILDLIFE, AND THE AQUATIC ENVIRONMENT, DOWNSTREAM FROM THEIR JURISDICTION.²¹ THESE AGENCIES CONTROL THE FAVOR DAYS IN MONTANA AND WYOMING.

THE AGENCIES REPORTED MINIMUM FLOWS FOR FISH, WILDLIFE, AND ENVIRONMENTAL PROTECTION WHICH RANGED FROM ZERO (FOUR INSTANCES) TO 38% OF THE AVERAGE FLOW. THE 38% FLOW WAS THE RESULT OF FISH AND WILDLIFE INTERESTS GETTING 500 CUBIC FEET PER SECOND (CFS) RELEASED BELOW KORTES DAM ON THE NORTH PLATTE RIVER IN WYOMING. CONGRESS REAUTHORIZED THE OPERATION OF THAT PROJECT, WHICH TOOK ABOUT 10 YEARS AND IS THE ONLY KNOWN ACCOMPLISHMENT OF ITS KIND IN THE U.S.A.

TWELVE OF THE 21 FLOWS ACCEPTED BY THE AGENCIES WERE LESS THAN 10% OF THE AVERAGE FLOW OF RECORD, WHICH IS INADEQUATE TO SUSTAIN THE NORMAL LIFE CYCLES OF EITHER WARMWATER OR SALICID FISHES.

FEDERAL AND STATE BIOLOGISTS ANALYZED FLOWS AND MADE FLOW RECOMMENDATIONS ON 12 OF THE STREAMS INVOLVED. HOWEVER, FLOWS ACCEPTED BY THE AGENCIES AGREED WITH THESE RECOMMENDATIONS IN ONLY 3 INSTANCES.

IN 10 OF 20 CASES, THE MINIMUM NATURAL INFLOW OF RECORD TO THE REGULATING RESERVOIR EXCEEDED THEIR RECOGNIZED RELEASE FOR THE CONSERVATION OF FISH, WILDLIFE, AND THE AQUATIC ENVIRONMENT DOWNSTREAM BELOW THE DAMS. ALL FLOW RECOMMENDATIONS SHOULD STIPULATE THAT OUTFLOW FROM DAMS SHOULD AT LEAST EQUAL INFLOW WHEN MANAGING AGENCIES CANNOT RELEASE

THE FLOW REGIMENS REQUESTED TO PROTECT THE ENVIRONMENT. PROJECT MANAGERS OFTEN REMINDED US THAT THERE WERE NO LEGAL REQUIREMENTS FOR PROVIDING ANY WATER SPECIFICALLY FOR THE CONSERVATION OR ENHANCEMENT OF FISH, WILDLIFE, AND ENVIRONMENTAL RESOURCES. WATER AGENCIES "SELL" THEIR PROJECT⁵ BY DECLARING THAT THEIR OPERATION WILL MODERATE THE EXTREME HIGH AND LOW FLOWS THAT OCCUR NATURALLY. JUST THE OPPOSITE WAS TRUE ON 1/2 OF THESE PROJECTS. THIS ANALYSIS DID NOT INCLUDE SCORES OF EXISTING, SMALLER PROJECTS UNDER THE PROGRAMS OF THE U.S. FOREST

SERVICE AND THE U.S. SOIL CONSERVATION SERVICE, MOST OF WHICH DID NOT RECOGNIZE OR PROVIDE ANY MINIMUM FLOWS FOR FISH, WILDLIFE, OR THE ENVIRONMENT.

MANY BIOLOGISTS COULD ENHANCE THEIR STREAMFLOW RESEARCH AND RESULTS THROUGH THE USE OF GOOD, WELL-PLANNED PHOTOGRAPHS. PICTURES MAY BE THE BEST DATA YOU CAN COLLECT FOR SELLING YOUR RECOMMENDATIONS TO THE GENERAL PUBLIC, ADMINISTRATORS OF CONSTRUCTION AGENCIES MANAGING WATER DEVELOPMENT PROJECTS, AND JUDGES OR JURIES ADJUDICATING WATER LAWS. BLACK AND WHITE PHOTOGRAPHS AND 35mm SLIDES OF KEY HABITAT TYPES (E.G., RIFFLES, RUNS, POOLS, ISLANDS AND BARS) FROM ELEVATED Vantage POINTS LIKE BRIDGES AND HIGH STREAM BANKS WILL GIVE RESULTS SUPERIOR TO GROUND LEVEL SHOTS OR PHOTOS FROM AIRCRAFT HIGH ABOVE THE STREAM. RECORD APPROPRIATE, VITAL INFORMATION ON ALL PHOTOGRAPHS AND SLIDES AS SOON AS THEY ARE DEVELOPED.

RECOMMENDATIONS

1. REQUEST "INSTANTANEOUS FLOWS" TO PREVENT FLOW RELEASES FROM DAMS AND DIVERSION STRUCTURES THAT ARE AVERAGED OVER A DAY, MONTH, OR YEAR, WHICH PERMITS ERRATIC RELEASES OR EVEN NO FLOW AT TIMES.
2. RECOMMEND THAT DUAL OR MULTIPLE OUTLETS TO ALL DAMS BE DESIGNED AND CONSTRUCTED SO THAT MINIMUM FLOWS OF AN APPROPRIATE TEMPERATURE AND QUALITY TO PROTECT THE AQUATIC ENVIRONMENT CAN BE BY-PASSED AT ALL TIMES, INCLUDING DRAWDOWNS FOR SAFETY INSPECTIONS AND EMERGENCY REPAIRS (WEST FORK OF BITTERROOT AND TONGUE RIVER RESERVOIR).
3. INSIST THAT COSTS FOR PROVIDING OF INSTREAM FLOWS TO PROTECT THE AQUATIC ENVIRONMENT DOWNSTREAM BELOW DAMS BE PROJECT COSTS,

INCLUDING COSTS FOR UNFORESEEN EMERGENCY REPAIRS AND ROUTINE MAINTENANCE OVER THE LIFE OF THE PROJECT.

4. JUSTIFY ONLY THAT PORTION OF A STREAM FLOW REQUIRED TO FULFILL SPECIFIC INSTREAM NEEDS. IF FISH NEED A FLOW OF 100 CFS IN A SEGMENT OF STREAM WHERE THERE ARE ALREADY LEGAL REQUIREMENTS OF 25 CFS FOR MUNICIPAL WATER, 15 CFS FOR IRRIGATION WATER TRANSPORT, AND 10 CFS FOR A U.S. ENVIRONMENTAL PROTECTION AGENCY WATER QUALITY REQUIREMENT, YOU LOGICALLY AND LEGALLY SHOULD ONLY HAVE TO JUSTIFY A FLOW OF 50 CFS (THE ADDITIONAL INCREMENT NECESSARY TO PROVIDE 100 CFS). PLANNERS OF WATER DEVELOPMENT PROJECTS MAY ASK YOU TO JUSTIFY AND APPLY COST/BENEFIT RATIOS FOR FISH TO THE 100 CFS FLOW BECAUSE THIS MAKES THEIR "PROJECT PURPOSE" LOOK MORE FAVORABLE ON A COMPARABLE COST/BENEFIT BASIS.
5. STIPULATE THAT DOWNSTREAM RELEASES AT LEAST EQUAL THE INFLOW TO IMPOUNDMENTS, WHENEVER OPERATORS OF WATER DEVELOPMENT PROJECTS CANNOT PROVIDE SPECIFIC FLOW REQUIREMENTS. MAKE THIS AN INTEGRAL PART OF EVERY FLOW REGIMEN RECOMMENDATION, PREFERABLY PART OF THE SAME SENTENCE;
6. REDUCED RELEASES TO A STREAM SHOULD NOT EXCEED A VERTICAL DROP OF 6 INCHES IN 6 HOURS (EQUAL TO 2 FEET IN 24 HOURS). FLUCTUATIONS GREATER THAN THIS MAY SIGNIFICANTLY DEGRADE AQUATIC RESOURCES.
7. REQUEST THAT MAXIMUM FLOWS RELEASED FROM DAMS NOT EXCEED THICE THE AVERAGE FLOW. PROLONGED RELEASES OF CLEAR WATER GREATER THAN THIS WILL CAUSE SEVERE BANK EROSION AND DEGRADE THE DOWNSTREAM AQUATIC ENVIRONMENT (BEAVERHEAD RIVER, MISSOURI RIVER, AND BIGHORN RIVER).

8. AVOID RECOMMENDING MINIMUM INSTANTANEOUS STREAMFLOW REGIMENS LESS THAN 10% OF THE AVERAGE FLOW SINCE THEY WILL RESULT IN CATASTROPHIC DEGRADATION TO FISH AND WILDLIFE RESOURCES AND HARM BOTH THE AQUATIC AND RIPARIAN ENVIRONMENTS (FIG. 1). ENCOURAGE LAWMAKERS TO PASS LEGISLATION THAT WOULD PREVENT DIVERSIONS OR REGULATION AT DAMS, WHENEVER IT WOULD REDUCE STREAMFLOW BELOW THIS LEVEL. IF WATER DEVELOPMENT PROJECTS CANNOT MAKE IT ON 90% OF THE WATER CARRIED BY A STREAM, USE OF THE REMAINING 10% PROBABLY WON'T JUSTIFY THEIR PROJECTS. PHILOSOPHICALLY, IT IS A CRIME AGAINST NATURE TO ROB A STREAM OF THAT LAST PORTION OF WATER SO VITAL TO THE LIFE FORMS OF THE AQUATIC ENVIRONMENT THAT DEVELOPED THERE OVER EONS OF TIME.

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ADDITIONAL COMMENTS

PAGE 4 DUREL C FILMS ON TORREVE
& POWDER RIVERS

AS THESE FILMS ARE IMPROPER AS THE
CAPACITY OF THE RESERVOIRS IS NO EMULATION
OF THE WATER AVAILABLE. THE FILMS SHOULD
HAVE BEEN MADE FOR ALL UNUSED AND UN-
APPROPRIATE WATER.

PAGE 13 LAST PP

WHAT HAPPENS TO DIVERTERS DURING NATURAL
LOW FLOWS - ARE THEY BREAKING THE LAW?
THERE IS A BIT OF IRONY ASSOCIATED WITH
THE DUES APPLICATION. THAT IS HIGH
FLOWS WILL BE MAINTAINED WHEN WATER
QUALITY IS NOT A PROBLEM AND LOW FLOW
WILL OCCUR ANYWAY WHEN WATER QUALITY
IS A PROBLEM. THIS APPLICATION, WITHOUT
A WAY TO IMPROVE LOW FLOW CONDITIONS
(i.e. RESERVOIR) IS UNFINISHED

PAGE 15

WHY NOT A HIGH LEVEL OF AGRICULTURAL
DEVELOPMENT AS AN ALTERNATIVE. See Comment 125

PAGE 19

4th Paragraph - CONTRADICTION

5th " " UNSUBSTANTIATED

PAGE 20

INSTREAM RESERVATIONS COULD EFFECT
EXISTING USERS WHO HAVE NOT COMPLETELY
DEVELOPED THEIR WATER RIGHTS (i.e.
BUFFALO RAPIDS IRRIGATION DISTRICT)

See Comment 126

PAGE 22 3 PP

SHOULD BE "PUBLIC GAIN" INSTEAD
OF "PRIVATE GAIN" PRIVATE IS A PART
OF PUBLIC

5 PP

WATER RESERVATIONS COULD BE IRREVERSIBLE
AND IRRETRIEVABLE IF DOWNSTREAM STATES
LAY CLAIM TO THIS WATER. See Comment 123

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WDM
1/12/76
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ADDITIONAL COMMENTS

Pages 127-128, STATE WATER RESOURCES BOARD
What are the scheduled flows based in TDS projections?
How are the projections from HDS and other non point source and point source contributions considered to determine the impact of all discharges with respect to TDS concentrations?
See Comment 127.

PAGE 124, TABLE III-20, MUNICIPAL DISTRICT
REGULATIONS APPLICATIONS See Comment 128 & pp. 3-8 CITY OF BILLINGS RESPONSE
Water requested for same or the communities in table III-20 seems to be high based on the projected populations given in the same table. What below are the specific communities, projected population and per capita water use calculated from Table III-20.

MUNICIPAL DISTRICT	Assmt	Population	Year	DAILY PER CAPITA CONSUMPTION
LIVINGSTON	15060	3540000	2000	366-387
Big Timber	1482	3,000	2000	1000
COLUMBUS	2406	4500	2009	579
LAUREL	14420	35000	2009	872
BILLINGS	317456	—	—	—
MILES CITY	21926	20000	1995	469
CALDWELL	13,956	35000-40000	2007	265-285
BROADBENT	605	4000	1995	125

DAILY consumption rates as presented above for the communities of Livingston, Big Timber, Columbus, Laurel, Miles City and Glendive would range from around 200 to 1000 GPCD. Although per capita daily consumption rates as shown are intended

WDM
1/12/76
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in Montana communities are presently in the range of 300-500 GPCD the high values as given in the report appear to be excessive for the years 1995-2007.

In addition to the above, the City of Billings request for 317,456 AFD's seems excessive. The EIS stated that based on 200 GPCD consumption rate that this would amount to a projected population of 1.5 million for Billings. A recent Economic Demographics study prepared for the Mid Yellowstone Economic Planning Organization (Economic Demographic Study, Great Falls, July 1975) Mountain West Research, Inc., Denver Colorado, projected the population for Billings listed below are the projections made in the above report for the Billings area in the year 1995.

Community	Year	Population
Reservings	1995	378
Billings		92585
Billings Heights		12652
Huntley		705
Laurel		8142
Lockwood		4785
Chaparral		480
Wardens		1007
Rural Residential	1995	12451
TOTAL PROJECTED POPULATION FOR BILLINGS AREA YEAR 1995		134,535

The Basis for the 317,456 AFD's figure on the City of Billings should be documented.

Capitol Station, Helena, Montana 59601
Eastern Montana Field Office
Ragenson Building
Glendive, MT 59330
Phone: 365-4462

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MONT. DEPT. of NATURAL
RESOURCES & CONSERVATION

January 10, 1976

Mr. Wayne Wetzel (and others)
Environmental Coordinator
Department of Natural Resources and Conservation
32 South Ewing
Helena, MT 59601

Gentlemen:

I find the Draft EIS basically sound as to depth of research and as to accuracy and I particularly want to congratulate you on a document that reflects good judgment in projections. However, I believe the EIS veers off true course where it approaches the specific matter of coal reserves and potential industrial development.

My attached written comments are offered in the spirit of cooperation and with a view to perhaps helping with the finalization of the EIS.

My comments are offered in three parts:

- I. General Comments;
- II. Specific Comments; and
- III. Final Statement, A Review of the Draft EIS In Relation to Possible Future Industrial Development.

I would appreciate receiving a couple of copies of the Final EIS for my review and for office usage here in Glendive.

Sincerely,

Allen J. Kimsey

Allen Kimsey
Energy Researcher

AK/as

Harold Frysliie, ~~XXXXXXXXXXXXXXXXXXXX~~ Director 406/449-3494

365-4462

Since EIS Reviewers of Active Storage
in Montana are concerned by sediment
flow

what is the basic or source of the projected reduction in active storage, in illustration. Moreover due to sediment entrapment. Data accumulated since 1950 on sediment yield above the proposed ~~hydroelectric~~ ~~sediment~~ ~~and~~ ~~indicates~~ that original estimates were not too high.

Should original estimates be high on sediment yield from the Powder River Basin above Moorhead, would the results at increase in active storage in the proposed Moorhead Reservoir have a significant effect on the amount of impacts of Alternatives considered in the EIS.

See Comment 129

YELLOWSTONE BASIN DRAFT ENVIRONMENTAL IMPACT STATEMENT

(Hearing: January 4, 1977)

I. GENERAL COMMENTS

1. Transcription and distribution (by mail) of hearing highlights and relevant comments to attendees for their post-hearing written comments:

This was suggested by the attendee lawyer (Intake). I see this suggestion as being possibly worthy of future consideration by DNRC as a permanent part of their services in the public interest. However, a reduced version of this service might only entail someone officially writing down the essence of comments, not the literal word-to-word version. The values of such a service are readily observable; I won't detail them except to say this tool would give some of the concerned local folks the means of officially making their comments heard upstairs (environmentally speaking). The comments would be formally recorded with a chance for the local folks to channel their stated desires to areas where they would play an increased role in decision making. I suggest an informal-style stenographer as the most functional and desirable way to accomplish this service if it becomes feasible in the future. Of course, there would be one disadvantage wherein an individual might not want his comments recorded. At his request, the recording service could be waived. See Comment 144.

2. As an additional feature of the Final EIS, I would like to see a simple and practical summary chart showing the acre feet/year totals for various potential applications stated in percentages which are based on minimal Yellowstone Basin flows, both in a typical "dry" year and in the critical dry month (August) at several key points along the main flow of the Yellowstone.

For instance, a typical chart would assess the Yellowstone at these selected points such as Miles City (which is just downstream from a considerable number of current applicants (Conservation Districts)).

At this selected point and others, we would in the chart see a complete picture of the worst possible set of circumstances, spelled out diagrammatically in percentages. See Comment 130.

This chart would reflect:

- 1) Critical minimum flows.
- 2) The worst combination of potential uses during times of minimum flows.
- 3) Percentages of water potentially assigned by the EIS projections to each category of use, such as fish and game, irrigation, industry, municipal and other.
- 4) Options as to how we can deal with these needs during the critical flow times.

3. A common-sense approach based on realistic apportionment may reveal that there is enough water for fish and game and recreation and all reasonable uses for many years. Furthermore, substantial yields from land already under cultivation may negate any need for developing new croplands.

4. It is my current belief that a factual approach to the problem of how much water is available and who gets what will relieve much of the mystery and illuminate many of the dimly lit areas that seem to plague the general public acceptances of the entire project of water reservations, water permits and associated matters. Points to consider are (stated not necessarily in their order of importance):

- 1) Make every effort to determine as soon as possible just how much water is legally available, or at least produce "working" figures.

As a part of this effort, in the Final EIS, give us a practical discussion concerning Indian water rights, Federal land water rights, and rights of Wyoming and North Dakota, etc. See Comment 131

In my opinion, a statement to the effect that all of this is unresolved and in litigation is not sufficiently precise and is not sufficiently responsive to such questions for use in a Final EIS on such important issues as water rights.

Tell us in the Final EIS exactly what DNRC and related involved agencies are doing to determine the facts of point (1). Tell us where we stand as to accomplishment of point (1) as of January 1977. In the Final EIS give us at least the best available estimate or best "working" figure as to how much water is legally available.

2. Give us at least a reasonable estimate on these matters; this will to some extent begin to lay bedrock under the great load of data, plans, projections and assumptions contained in the bulk of the Final EIS.

3. Discuss briefly or show in a chart in the Final EIS in straight-forward manner exactly what you foresee as the primary demands on this determined point (1) amount of water.

4. Discuss briefly the currently available options, from only a technological viewpoint that could be used to mitigate the "August crunch" and the "dry-year crunch," this would include: pinpointing on one of the maps all of the possible technologically-feasible off-stream storage sites; discussion of whether low-water dams across the Yellowstone would be technologically feasible as well as a pressing necessity before Year 2000 if things go badly and a maximum amount of water is requested for both irrigation and new industrial developments. Here I am requesting that these discussions of point (2) be done solely from a technological reference base (the Draft EIS of course by basic intent adequately explores matters from an environmental base on this same issue of what to do in the "August crunch" but is possibly deficient in the additional discussions from a true technological base of reference). Stating that "we all suffer" is perhaps not precise enough to cover this very important point. See Comment 132

5. Discuss the plans or lack thereof to hold a joint Wyoming-Montana-North Dakota water meeting to ascertain finally the legal amount of water available to Montana. Has the 1950 tri-state Compact bogged down or is it scheduled for renewal in the near future? If so, when? See Comment 133

6. Add to the Final EIS a new chart which compares all industry, fish and wildlife, recreational, municipal, irrigation, etc., application requests with the actual amounts of water that DNRC is considering for allotment to them. See Comment 134

6. Show on one of the maps the locations of potential "storage facilities" for irrigation on the Tongue and Powder Rivers. Discuss exactly what kind and sizes of dams, etc., are planned. Earthen dams? Who will fund these irrigation projects? I believe some of this location information is already in the text but it would help to have it assembled on one map. See Comment 135

5. Possible inflation of application requests: Perhaps a reasonable amount of overstatement of future (year 2000) needs is understandable on the part of a concerned water applicant. However, I continue to believe that some of the applications in the Draft EIS could possibly represent as much as a doubling of actual potential water needs for the period of years prior to year 2000. Apparently, DNRC felt likewise in more than a few cases, for in some instances they cut conservation district requests in half.

Referring to original water reservation requests (prior to DNRC review), I suggested at the hearing that possibly some over inflation existed and that this (if awarded) might preclude successful servicing of true needs in year 2000.

I was assured by DNRC that they hardly agreed with this view and also some comments from others likewise disagreed with this view.

Yet, later in the hearing representatives of the individual conservation districts began pointing out that their requests had been cut literally in half as a result of DNRC review and studies.

The above is a preface to the main point of my statement--that is, a practical approach to water apportionment will allow enough water for all applicants, except as noted in Part III of my comments. See Comments 136, 112 and 12

I believe that the Final EIS should discuss the matter of another alternative: i.e., exploration of a scenario wherein the amount of legally-available water is ascertained first and then this amount worked back up through the list of applicants and assign on a practical priority basis.

Let's continue to look at the River and determine just how much water is legally available and then work back upstream (figuratively speaking) and determine a priority of applicants (i.e., people and domestic uses (first): agri-cattle (second): industry (third): recreation and fish culture (fourth) etc.

I realize that legal problems stand in the way of determining exactly how much water is legally available. However, how can one even begin to assign water rights until the basic amount of water in the river has been established? It is my view that the Final EIS should not only squarely face these obstacles but should additionally, in a one, two, three manner present to us an overall plan that DNRC is following to deal with this and produce "working" figures.

Is the extension of the moratorium an important requirement to working out legal tangles? See Comment 137

Can you give us in the Final EIS a boiled down but factual look at where we stand in regard to Federal water and Indian water rights as they affect the above problems of determining how much water is legally available?

I would like to see in the Final EIS an evaluation of obstacles as they face us today and a statement as to what is being done to fix them and an estimate as to how soon this may be accomplished.

A good place to start would be with determining how much water the folks at Miles City, or Billings, or Glendive have to work with (after other prior and legally-binding water rights have been subtracted).

If I were asked to make only one statement as to what would improve the Draft EIS, I would say: face these obstacles squarely and in specific language and come up with the best appraisal you can give us at this time as to how you plan to deal with them, plan some sort of time-schedule as to anticipated goals or accomplishment. Show some plain talk and charts and graphs that portray these problems and the possible solutions.

II. SPECIFIC COMMENTS

Page

10

Paragraph

5

Comments/Questions
 "...neither of the two large requests for instream flows can be satisfied without modification."

DNR & C apparently adequately dealt with too-high requests of irrigation users in the Draft EIS.

The problem of dealing with modification of instream requests could aptly be discussed in the Final EIS. Why not give us an estimate of how these instream flows can be cut back @ better relate to other potential users of water and also in relation to each other (i.e., the two large requests).

12

4

"specifics not stated because detailed engineering and economic studies are necessary to determine the combination of uses that would maximize benefits."

I believe that in the Final EIS such specifics should definitely be stated to the degree of completeness that is possible at this point in time. Again, stating that something is in litigation or is not complete is not necessarily the best way to go in a Final EIS. In my opinion, it is best to give us specific details even if they are incomplete.

Specific discussion is needed on all points in a Final EIS. If it is incomplete, then label it as such and give us the advantage of your best specific up-to-date data, such as potential location (from technological viewpoint) of dam sites; estimated costs; potential conflicts as to amounts of water vs potential users. If you have no data or no estimates then a simple statement of this lack of data should suffice.

Page	Paragraph	Comments/Questions	Page	Paragraph	Comments/Questions
12	4 (Cont.)	In my view, the degree that a Final EIS veers off its true function of presenting facts and figures and hard data, the more it becomes a document that serves its function in name only. It then becomes ambiguous and hard to understand.	39	Map I-2	The great bulk of the Yellowstone Basin stripplable coal reserves apparently lie along the east perimeter of the Tongue River and within 10 to 20 miles west of the Powder River and in the general area of current Colstrip developments.
13	6	Again, give us the best and most detailed information you have available at present and label it as such.			QUESTION: Are some, or perhaps many of the industry water applications aimed at new water-using operations on the Tongue and Powder Rivers, also connected with mining this coal or putting it to use in mine-mouth coal-fired electric generating plants or future gasification plants, ammonia plants, etc.?
		Concerning the "willingness of energy-related companies to invest in water storage, diversion, and conveyance facilities."			If the answer to the above is "yes," then I believe some detailed discussion is definitely in order for the Final EIS.
		In the Final EIS I would like to see a lot more on this. Where are these specific potential storage locations?			I would like to see point-in-time details on where those "water storage, diversion, and conveyance facilities," would be potentially located plus facts and figures on possible degradation of ground water in the vicinity of the Tongue and Powder Rivers.
		What exactly is meant by "diversion" facilities? Canals; pipelines? If so, where are the currently-suggested routes.			
		Who pays for these "facilities"? Joint industry-government funding? <u>See Comment 138</u>			
15	entire page	I believe a discussion on one central point would be of help; i.e., under the no-action plan, essentially no legal safeguard exists for the Yellowstone.			Perhaps it is worthy of comment in the Final EIS that the most extensive stripplable coal deposits and the two streams that are apparently most in danger of being degraded and dewatered exist in close proximity to one another.
19	8	Should this no-action alternative even be considered in view of lack of legal protection and the inherent disadvantages? <u>See Comment 139</u>	116 117	7 1,2	I believe that some special discussion on this might be wise in the Final EIS.
		Would the "energy emphasis alternative" really be the same as the no-action route? <u>See Comments 140 & 87</u>			The legal situation is discussed but there are no estimates or indications of how much water is involved in these cases relating to Indian and Federal lands. I believe there
		Does this merely mean that instead of water reservations, under the energy emphasis plan you would assign water in the same quantities and for the same uses except by permit rather than reservation?			<u>See Comments 34, 68, 70, and 131</u>

Page	Paragraph	Comments/Questions
117	1,2 (Cont.)	should be some way that estimates or water quantities in question could be compiled and used for purposes of the Final EIS and associated evaluations prior to finalizing all the legal entanglements. Obviously, it may be a very great number of years before legal cases are completed. In the meantime, for purposes of planning and assessing things both from technological and environmental viewpoints I believe we need some ballpark figures to work with.

117 3,4 See Comment 64
Concerning the Yellowstone River Complex:

118 Table I-35 What is actively being done to arrange tri-state meetings that would result in at least some sort of workable figures as to how much water Montana can tentatively lay claim to. I believe that such ballpark figures should be developed in the Final EIS for use by environmentalists, industrialists, and researchers in governmental agencies.

Can the figures shown in Table I-34 and I-35 be used for working estimates at this point in time? Or, do these figures represent values that are being hotly contested by the neighboring state of Wyoming?

124 3 "the proper allocations of water between Montana and Wyoming are not exactly known,"

Is this being negotiated currently under the Compact mentioned elsewhere? See Comment 64

123 124 What is the State Water Planning Model in reality? See Comment 86

Is it a computer program? A set of formulas? A file of reports?

I studied pages 123 and 124 and still am about as uncertain as I was at the beginning. You speak of "calibrating" the model and inputs and outputs but I still have reservations as to whether the model is something you plug into a 110-volt line or just a set of formulas or something else.

Could you clarify this in the Final EIS?

Page	Paragraph	Comments/Questions
199	Table III-25	I found this table of great potential interest but hard to decipher. See Comment 103

For instance, consider the "80 percentile" line - does this mean a true 80% of the lowest flow recorded in May, June, etc.? Or is it much more subtle than that?

Consider the "F & G" line, top line across. Are we indicating that fish and Game requested 15,685 acre feet/year total for month of May? Or is 15,685 some sort of percentage of the total? Or is it even more subtle than that?

Frankly, I do not grasp the methodology behind Table III-25 but very definitely wish to pick up the relationships contained there.

Could this table be more fully documented as to denoting unit of measure of percentages where needed to make the table graspable by the average person without an unnecessary amount of speculation?

What does "percentile" mean as used here in this table?

A paragraph of explanation and/or some additional notes on the table itself would help us grasp this in the Final EIS.

Is the 80% a tie-in with the Compact with Wyoming and thus a working total? If so, then you have already begun to use "working" figures on water totals and legal amounts of water, why not carry through and do the same thing for other streams and other parts of the Final EIS?

III. FINAL STATEMENT
A REVIEW OF THE DRAFT EIS IN RELATION TO POSSIBLE
FUTURE INDUSTRIAL DEVELOPMENT

The Draft EIS applies very well if nothing much develops or happens in the next 23 years; i.e., between now and year 2000. This is a highly untenable position. It is my opinion, and that of others possibly, that a high degree and range of industrial development will probably occur within this period of time. Thus, in this light, the Yellowstone Basin Draft EIS goes pretty wide of the mark.

See Comment 14)

By looking back over the past 23 years to year 1954, one can easily see that this was a relatively stable period in our history. But even so the rate of industrial development increased tremendously all over the U.S.

Consider this "normal" development and add the possibility of open conflict in the oil-producing nations and the development of coal reserves and resulting industrial build-up in eastern Montana could be enormous.

Generally speaking I view the Draft EIS as somewhat overly conservative in respect to considering potential development of coal and related industry plus, of course, the added socio-economic effects.

Finally, consider just one possible instigator of development; consider world turmoil at present and the prospects for more in the future. On any given hour of any given day the bulk of the 44% of imported oil into the U. S. could be shut off by a single event in one or two of the critical geographical locations. This would undoubtedly create an immense amount of development in certain areas of the Yellowstone Basin.

Concerning the presently widespread method of disposal of treated sewage water from all towns from Livingston to Glendive, I can't readily accept the possibility that DNRC has accidentally overlooked this very important Yellowstone impact in the Draft EIS.

More development will insure greater volumes of treated sewage water being channeled into the Yellowstone River. We discussed all other possible degradation sources but seemed to have skipped over this one. I would like to see a

III. FINAL STATEMENT
-2-

discussion of the present status of treated sewage water vs. impacts on the Yellowstone and projections on whether the present city lagoons can handle increased loads, etc. Also, what is the purity level of the treated-water inputs from all towns at present; please give the EPA standards and, if possible, relate present purity levels to these standards.

In summary then, I believe the Draft EIS is much too conservative in its consideration of potential environmental impacts and its general approach to possible industrial development resulting from development of coal reserves and usage of water in the Yellowstone Basin.

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BEFORE THE BOARD

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MONT. DEPT. OF NATURAL
RESOURCES & CONSERVATION

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TELEPHONE (609) 442-0070

January 12, 1977

Department of Natural Resources
and Conservation
32 South Ewing
Helena, Montana 59601

Attention: Mr. Gary Fritz

Re: Comments Upon Draft Environmental Impact Statement--
Applications for Water Reservations by Various State
and Public Agencies--Yellowstone River Basin

Gentlemen:

Enclosed are the Comments of our client, Intake Water Company,
upon the Draft Environmental Impact Statement dated December 13,
1976. In order to comply with the time restriction, this letter
and the enclosed Comments are hand-delivered to the Department
today.

We have not circulated these Comments, as that is the obligation
of the Department under MAC 36-2.2(6)-p240.

However, in accordance with the last paragraph of that rule, we
request that copies be made available to us of all written comments
received, including written responses received from the applicants.

Sincerely,

LOBLE, PICOTTE & PAULY, P.C.

By 
Attorneys for
Intake Water Company

HL:bb
Enclosure - Comments

IN THE MATTER OF APPLICATIONS FOR)
RESERVATION OF WATER NO. 1781-I)
6294-I, 8476-I, 9442-I, 9646-I,)
9931-I, 9933-I, 9934-I, 9935-I,)
9937-I, 9938-I, 9939-I, 9940-I,)
9941-I, 9942-I, 9943-I, 9944-I,)
9945-I, 9946-I, 9947-I, 9948-I,)
9949-I, 9951-I, 9952-I, 9953-I,)
9954-I, 10,003-I, 10,004-I,)
10,005-I, 10,006-I,)

COMMENTS UPON DRAFT
ENVIRONMENTAL IMPACT
STATEMENT FOR WATER RESER-
VATION APPLICATIONS IN
THE YELLOWSTONE RIVER
BASIN

Following are the comments of Intake Water Company (Intake)

upon the above-described Draft Environmental Impact Statement

dated December 13, 1976. Intake has a competing water permit

application (No. 3763s42U) to that of the Department of Natural

Resources and Conservation (DNRC) application to reserve water

upon the Powder River, an interstate tributary of the Yellowstone

River, for the construction of a storage and diversion facility

known as Moorhead Dam and Reservoir (water reservation application

No. 9941-I).

The Draft Environmental Impact Statement (DEIS) purports to

comply with the Montana Environmental Policy Act (MEPA - Section

69-6501 et seq.) by attempting to set forth the environmental

impact of all thirty applications for water reservations which

have been filed. In so doing, the DEIS fails to specifically

deal with the environmental impact of each application. It is

not site specific. For example, and without limiting the

See Comment 78

See Comment 142

generality of the foregoing, in the case of application No. 9941-r of the DNRC to construct Moorhead Dam and Reservoir, the environmental impact of the construction of this proposed \$100 million facility is not discussed at all. Obviously, there is substantial environmental impact involved in building a huge dam, inundating a large area of land with the reservoir, building diversion facilities and a distribution system, but this is not discussed. Neither are possible impacts to archeological, historical and cultural values discussed, nor is the socio-economic impact discussed, nor is a benefit-cost analysis given. No economic analysis is given as required by MEPA and House Joint Resolution No. 73 approved March 16, 1974. Nothing is discussed concerning aesthetics or visual impact.

See Comment 143

Intake, in the proceedings being conducted by the DNRC for agency review of the applications, has objected to the following applications: Nos. 9941-r, 1781-r, 10,006-r, 9931-r, 9933-r, 9934-r, 9947-r, 9943-r, and 9946-r. The foregoing applications are not entitled to be processed under the Montana Water Use Act (Section 89-865 et seq.), nor under the regulations adopted by DNRC for reservations of water under such act (administrative regulation No. 36-2.14R(1)-S1400 et seq.). For example, and without limiting the generality of the foregoing, in relation to reservation applications involving storage or diversion facilities such as that of the DNRC for Moorhead Dam and Reservoir and the conservation districts above named, regulation 36-2.14R(1)-S1440 was not complied with so that the applications are not entitled

to be processed as is stated in regulation 36-2.14R(1)-S1420. Such regulations require, among other things, an established plan which must accompany the application. The plan must be sufficiently detailed to adequately define the size and function of the construction of the diversion, conveyance, and application facilities. The plan must be prepared and documented to the highest degree of detail possible and accompanied by maps or drawings showing the project locations, place of water use, point or points of diversions, and other relevant information. This is required to preclude speculation, and these applications do not meet those requirements. In addition, the economic feasibility of the project or projects must be discussed with documentation supporting such economic feasibility. Other requirements are set forth in other parts of the rule but, it is quite clear that the applications to which objection has been made by Intake do not comply with the regulation in question and cannot, therefore, be processed. In addition, it is not possible to set forth the environmental impact of any such project or projects unless sufficient detail is provided to indicate what is proposed, and in this case, no such detail is submitted nor was it available to the DNRC at the time of the compilation of the DEIS. It is quite impossible to do a satisfactory and legal DEIS for a proposal which is so lacking in detail as to be formless, vague, and uncertain.

See Comment 1

Too little time was allowed for the examination of the DEIS for proper comment to be made by agencies and members of the public. The public hearings began in Glendive on January 4,

1977, at 9:00 o'clock a.m. From the time of preparation of the DEIS, which was December 13, 1976, until January 4, 1977, was only a little more than twenty (20) days. This is an inadequate amount of time to analyze and prepare comments on a lengthy DEIS consisting of two volumes, over 400 pages and containing much technical and scientific information. Even if written comments are submitted, thirty (30) days is entirely too short a time for preparation of meaningful comments. As a result, no true public involvement was possible for comments upon the DEIS.

See Comment 5
The DEIS is too technical and written in language which is too complicated for the public to understand. It is overly conclusory, and the conclusions stated are not supported by the facts and data from which such conclusions are derived.

The alternatives set forth in the DEIS are not sufficiently analyzed or discussed to give the reviewer a chance to make a reasonable choice.

See Comment 144
At the public hearings held in Glendive, Miles City, Billings, Livingston, no court reporter was employed to record the comments of the public on the DEIS. The only method of recording those comments was through a tape recorder which was mechanically inadequate for the purpose. Moreover, the officials of the DNRC at the hearing announced that these comments would not be transcribed. Therefore, they will not receive consideration as is required by law and the regulations applicable thereto. At least for the hearing at Glendive, no list was kept of the persons who made comments and no attendance sheet was kept so that a copy of

the final EIS could be mailed to such persons. The dates for the hearings to receive public comments on the DEIS were changed at the last moment, and insufficient notice was given to the public of such changes so that members of the public were thus misled and did not attend when they otherwise would have.

See Comment 145
The fees required to be paid for the preparation of an EIS by the reservation applicants, as provided by Section 89-8-102.2, R.C.M. 1947, were not paid, and accordingly, all of the applications are void.

See Comment 146
Under the law, the Environmental Impact Statement must accompany the proposal through the existing agency review processes as referred to in Section 69-6505, R.C.M. 1947, and that is not true here. The agency review processes were started some time ago, and the Environmental Impact Statement has not even been finalized. Action which requires the preparation of an Environmental Impact Statement was taken sooner than 60 days after the transmittal date to the Governor and the EQC of the Draft Environmental Impact Statement, in violation of regulation 36-2.2(6)-P240(5)(c). In addition, the procedure which has been adopted will inevitably lead to a violation of regulation No. 36-2.2(6)-P240(5)(d). Because of the failure to provide means of recording and transcribing public comments at the hearings, the DNRC will not be able to respond to the comments made there in a good faith evaluation of the comments received, and as substantive disposition of the issues involved, all of which is in violation of regulation 36-2.2(6)-P240(3)(c).

See Comment 147

Substantial errors were made in land descriptions so that the notice published by direction of Sections 89-890 and 89-881, R.C.M. 1947, did not correctly identify the lands involved in the applications for reservation of waters and the information therein contained was false, misleading, and said notice and all proceedings based thereon are therefore invalid and illegal.

See Comment 78

The DEIS is not an Environmental Impact Statement upon the specific applications involved but is, instead, only a discussion of programmatic proposals. Such programmatic proposals do not contain sufficient facts to enable a true Environmental Impact Statement to be prepared which will deal with specific actions which will affect the environment within the meaning of MEPA. Indeed, such programmatic proposals are so vague, uncertain and indefinite as to be speculative, contrary to the law and the regulations thereto.

The page references hereinafter set forth are for the DEIS.

SPECIFIC COMMENTS RELATIVE TO THE POWDER RIVER SUBBASIN See Comment 148

On page 12, under the heading "Multipurpose Reservation Requests", it is indicated that the firm annual yield contemplated on the Powder River would require use of water allocated to Wyoming under the Yellowstone River Compact, and there is no way that Montana can reserve Wyoming water. The water reservation statutes of the State of Montana have no application in the State of Wyoming. So, the project of the DNRC on the Powder is not possible of accomplishment. The DNRC has not even applied for water in Wyoming. Furthermore, in connection with this project, it is stated:

"Specifics are not stated because detailed engineering and economic studies are necessary to determine the combination of uses that would maximize the benefits."

See Comment 149

These multipurpose applications should not even be considered until such specifics are available. See Section 89-890, R.C.M. 1947, and Regulation 36-2.14R(1)-1440 and related regulations.

See Comment 150

On page 13 it is said that energy-related companies are willing to invest in water storage, diversion and conveyance facilities, and it is implied that they would do so if the Fish and Game request was granted in full. If the highest level of both the Fish and Game and Board of Health requests were to be granted, would there be water available, even in flood periods, for storage, diversion and conveyance, on an economically feasible basis?

On page 17 it is said that aquatic eco-systems would suffer severely in the Powder subbasin, but this does not take into Response and consideration the building of storage (Moorhead Dam and Reservoir)

See p. 1 of Fg's Comments 142 & 151

on the Powder River for which Intake Water Company has an application. Actually, there is every possibility that aquatic eco-systems, including fisheries, would be benefited by Intake's proposed Moorhead Dam. In this connection, the DEIS has not considered, at all, the alternative of approval of applications for water permits such as that of Intake Water Company for Moorhead on the Powder River.

On page 22 it is said:

See Comment 152

"Most of the consumptive-use reservations, if approved, would be implemented over the next few years, as projects were built and water diverted."

This statement is untrue. For example, application No. 9931-R, for irrigation by the Department of State Lands contemplates putting the water to a beneficial use in December of the year 2000. The same year 2000 is contemplated by the Powder River Conservation District and the year 2007 by the North Custer Conservation District. On the same page it is said: See Comment 153

"* * * water reservation decisions cannot be considered absolutely irreversible and irrev-
triable."

See p. 1 of Fg's Response

However, they are irreversible and irretrievable if downstream states apply the water to beneficial use during the time the reservations are in effect and the water is not being put to use in Montana. Such downstream states would thus acquire a priority. This is true for either instream or consumptive use reservations.

On page 55 is set forth, in Table I-7, "Salinity Hazards for Irrigation Waters". This table, when compared with other data in the DEIS, indicates that Powder River water for which application is made for water reservations, would be, for all practical purposes, including economic feasibility, unusable. This should be commented upon, analyzed, and specifically dealt with. There would be no purpose in granting a water reservation application for irrigation on the Powder if the water would not be suitable, because of high saline content, for irrigation of crops.

See Comment 154

On page 116 it is said:

"* * * DNRC has initiated action to adjudicating existing water rights in the Yellowstone Basin, * * *"

See Comment 156

This statement is deceptive. It does not say that the only such

action which has been initiated in a substantive way is on the Powder River.

On page 135 under "Irrigation Reservation Requests," only the applications of the conservation districts, the irrigation districts, and the Department of State Lands are considered when the application of the DNRC to use water of the Powder River at proposed Moorhead Dam, also contemplates use of irrigation water. Again, on the same page it is said:

"It should be emphasized that projects identified in the request are not firm commitments for future development, but only possibilities for water use. Individual land owners, in most cases, are not aware that their lands are included."

See Comment 143

When this statement is considered in the light of DNRC regulation 36-2.14R(1)-S1440, it is obvious that the conservation district applications in question are speculative and, generally speaking, completely in violation of the regulation in question, and should not even be processed. This thought is again emphasized on page 136 where it is said:

"Consequently, the use and interpretation of this reconnaissance-type classification is definitely limited. Because the extent of the irrigable area as determined by this type of survey could be erroneous by 15 to 30 percent, any actual project developments should be based on a detailed study to pinpoint the exact location and limits of the land best suited for irrigation."
(Emphasis ours)

Such a detailed study should be made now, so that it can be considered in the Environmental Impact Statement, and not later.

At the very least, the location and limits of the lands involved

should be known for MEPA purposes. How can environmental impact be measured when the location and limits of the lands involved are not known? How, for instance, can archaeological, historical and cultural values be considered under such circumstances? Again, on page 136 it is said: See Comment 142

"Comparison of these budgets and the expected irrigation costs indicate possibilities for profitable irrigation development." See Comment 155

Yet, under the regulations of the DNRC, the project must be a financially feasible undertaking. An analysis must be made in the EIS as to financial feasibility. The figures of the applicants, appearing as weak as they do in the applications, cannot be accepted and must be analyzed. For example, in the Powder River Conservation District application under the heading "Water Supply", on an un-numbered page, it is said:

"For purposes of this study, no new water availability water right studies have been initiated. An assumption basic to this application is as follows: storage could be developed in the Powder River and a portion of this storage would be made available to irrigation users at a reasonable cost for purposes of evaluating economic feasibility, an arbitrary value of \$10 per acre-foot was chosen as cost, realizing that a final value is dependent upon the specific situation."

A statement such as this cannot be accepted, particularly in light of the regulations of the DNRC concerning water right reservations. There is nothing whatever in the DNRC application for Moorhead Dam which indicates economic feasibility in any respect, or at all. Therefore, it is fatal to an Environmental Impact Statement

not to consider these basic matters. Again, in the Powder River Conservation District application, the following statement appears:

"Costs are not included for investigation, engineering, legal, acquisition of lands, inflation, and conservation district overhead, as these are unknown. In the case of the Powder River, costs were extracted directly from the USBR Powder Division Report without updating from April 1955 prices".

Similar statements are made in the North Custer Conservation District application. Cost-benefit analyses must be made under MEPA and House Joint Resolution 73 (1974).

In the Powder River County Conservation District application under the heading "Water Quality" it is said:

"Water quality is of primary importance to irrigated agriculture as it affects soils and crops and the management necessary to offset the water quality problem. Water quality is a factor in most areas of Powder River County and was analyzed for this application."

No conclusions are given, as far as we can determine, as to the results of such analysis. The EIS should carefully consider this serious matter of water quality on the Powder River for all applications which involve Powder River water, such as the Powder River Conservation District, the North Custer Conservation District, and the Prairie County Conservation District. Indications in the DEIS are that water quality will be so poor on the Powder as to preclude use of Powder River water for irrigation for all practical purposes.

On page 148 it is said:

"A total of 26,150 acres are planned for irrigation in the Powder River subbasin.

In Table III-15, on page 155 it is said in footnote c:

Water for these proposed projects would require additional storage on the Powder River." See Comment 157
Would these projects be economically feasible if such additional storage, and the cost thereof, is considered? Again, in discussing the Powder River County Conservation District reservation application it is said, on page 149 as follows:

"It was assumed for purpose of this reservation application that substantial onstream storage will be provided in the future to meet the full potential for irrigation development."

This question of storage on the Powder should be analyzed from the standpoint of feasibility, possibility, and generally, as it relates to irrigation in order to see whether it can be built at all. All considerations must be analyzed, such as economic feasibility, physical construction, diversion sites, distribution systems, and an EIS, detailed in nature, prepared on that particular project, i.e., Moorhead, which, as stated in the DEIS is an absolute condition precedent to irrigation on the Powder as contemplated in the applications for water for this purpose on the Powder.

On page 154 it is said:

"According to the data submitted in the reservation applications, benefits would exceed costs of proposed projects in all cases; thus the proposals are economically feasible."

Such a statement cannot be made without analyzing the data, particularly in view of the fact that unacceptable statements concerning costs and assumptions made relative thereto are set forth in the various applications.

"The Powder River Conservation District included in its proposed irrigation projects 1,745 acres of state and federal lands. Because the application did not identify which lands were state and which federal, it is not known how much of each the district anticipates will be irrigated."

How can a final Environmental Impact Statement be written on a project which does not clearly identify the lands which will be irrigated?

Table III-16, page 156, is unreliable and further illustrates the uncertainty of the entire DEIS. For instance, it is said under the word "NOTE" at the bottom of the page:

"Estimate of profitability, secondary benefits, and employment benefits can only be regarded as rough estimates because the studies were not sufficiently detailed to provide more exact ones."

On page 167 it is said:

"The Department of State Lands rules and regulations require that, before state funds are used in development or irrigation facilities, certain requirements must be met. In addition to adequacy of water supply and irrigable soils, economic feasibility must be demonstrated."

Yet, as far as we can determine, no economic or cost consideration is given to the building of Moorhead Dam, and without Moorhead Dam, no water will be available for irrigation of state lands with Powder River water. This same observation is true as far as other applications are concerned which contemplate use of Powder River water such as Powder River Conservation District, North Custer Conservation District, and Prairie County Cooperative Grazing District.

On page 171 it is said:

"The application for these lands does not demonstrate financial or economic feasibility."

Any lands for which financial or economic feasibility cannot be demonstrated cannot be considered.

The uncertainty of these applications is demonstrated by the statement on page 172 where it is said:

"No figure is given in Table III-19 for Powder River Conservation District, since its application did not differentiate between the state and federal land (a total of 1,745 acres) excluded."

On page 177 under the heading "Multipurpose Reservation Request", it is said:

"In effect, these applications request all unused and unappropriated water in these basins upstream from the dam sites. Without additional storage, significant new water development in these subbasins will not be possible."

"The purpose of the request is to provide water for multipurpose projects. The reserved water would be for all beneficial uses. Specific uses are not stated because detailed engineering, economic and environmental studies are necessary to determine the combination of uses that maximizes benefits from the water and minimizes adverse environmental impacts."

How can an Environmental Impact Statement be written without detailed engineering, economic and environmental studies? An Environmental Impact Statement must accompany the application through its agency review. How can this be done if insufficient detail is provided, and admittedly so, to write an EIS at this time or at any time in the foreseeable future? Such a mind-boggling statement makes the

whole process we are going through absolutely ludicrous. It is absurd to say in what purports to be an Environmental Impact Statement that we need detailed engineering and economic and environmental studies before the benefits can be maximized and the adverse environmental impacts minimized. That is the purpose of an Environmental Impact Statement, and until such detail is available, nothing is accomplished. When the specific uses are finally determined, the environmental impact may be entirely different than anything that is contemplated now. These determinations must be made, now, and not later. This is the time for environmental studies, not after approval is given. That is the whole purpose of the Montana Environmental Policy Act, and the whole purpose of the Environmental Impact Statements. For instance, also on page 177 it is said:

"It is unknown at this time what level of instream flows can be granted, if any, and still maintain the feasibility of the projects."

If that is unknown, so is the environmental impact unknown, and an EIS without that information is absurd.

On page 203 it is said:

"* * * it is clear that Montana should not reserve waters to which Wyoming is entitled."

This being true, the Moorhead application of the DNRC, No. 9941-r, cannot be approved. This is substantiated by the following which appears on page 204:

"Wyoming could deplete a sizeable portion of the Powder River under provisions of the Yellowstone Compact; therefore even a water storage facility might make only a small amount of water

available for consumptive users; certainly not enough could be developed to make construction of a dam economically feasible."

On page 224 it is said:

"The multipurpose requests in the Tongue and Powder Rivers are not included in this variation, because these requests do not specify the amounts of water to be diverted and consumed, and because some of the same water would be diverted and consumed if granted and implemented under the irrigation requests."

How can an Environmental Impact Statement be prepared for a project or for a request which does not specify the amounts of water to be diverted and consumed?

On page 248 it is said:

"Because of extreme streamflow fluctuations and a lack of water storage, the Powder can presently sustain no significant additional development. Extensive development such as that envisioned under this alternative would require the construction of proposed Moorhead Dam and Reservoir."

Again, the cost and feasibility of Moorhead Dam and Reservoir must be analyzed in connection with all applications for use of Powder River water.

On page 257 it is said:

"In the Tongue and Powder subbasins, TDS concentrations would be high enough even at the low and intermediate development levels to make using that water for irrigation unwise."

How can a reservation for water on the Powder be granted, for the purposes of irrigation, if the water can't be used for irrigation? On pages 278 and 281 it is said under the heading "Water Quality",

"TDS concentrations already extremely high in the waters of the Powder River, would increase significantly under any of the levels of development."

"* * * Even so, and even for the low level of development (as shown in Table IV-15), in one year out of two, on the average, total dissolved solids in the Powder River which now average over 1,100 mg/l, would increase to over 3,000 mg/l in several low-flow months, including the irrigation season. Occasional (i.e., at the 90th percentile level) values would be even higher."

"The TDS concentrations would increase even more for the intermediate and high levels of irrigation development, especially (1) if the irrigation return flows pick up additional salts from the land, and (2) as the dilution volume of the reservoir decreases due to sediment deposition."

The chart entitled Table I-7 "Salinity Hazard for Irrigation Waters" on page 55 says that TDS concentrations of 1,000-2,500 mg/l are

"high; unsuitable for most crops unless careful management is employed", and of 2,500 mg/l or over as "severe; unsuitable under most conditions." Why would agricultural reservations be granted for use of Powder River water when the water will be totally unusable for irrigation? If measures are planned to be taken to reduce the salinity content of the water so that it is useful for irrigation, how costly will that be and will the projects then be economically feasible? Consideration must be given in the EIS not only to whether the irrigation water is usable, how much it would cost to make it usable, but what the environmental impact would be of using this sort of water on the lands along the Powder. Also, what is the environmental impact of the return flows of such undesirable

water to the river itself? Compare, also, Table IV-15 on page 282 to Table I-7 on page 55, and discuss the usability of Powder River water on the basis of these two tables. See also on pages 283 and 284 where it is said:

"The construction of Moorhead Dam would make a great deal of water available. However, even at the low projected level of development, the quality of the water would be unacceptable for irrigation at least one year out of two. Provision of in-stream flows may mitigate that water quality degradation to the point that, with careful water management, irrigation water use may be expanded."
(Emphasis ours)

The time to decide whether it is possible to use irrigation water on the Powder at all is now, and not later. No application for the use of such water can be further considered, or even processed until all of these questions have been decided, including the economic feasibility of mitigation of the saline water content, and whether the use of Powder River irrigation water would be economically feasible taking into consideration the mitigating processes that must be adopted, the decreased amount of water that would be available for use, and the uncertainty of the supply on a month-by-month and year-by-year basis, particularly in irrigating season, plus damage to the land from application of water of low quality. In light of the benefits to the Powder River from the building of Moorhead Dam, wouldn't the use of a majority of the Powder River water for industrial purposes be far the best alternative? This would apply not only to fisheries (which the DEIS says would be benefited), but also to the entire aquatic eco-system.

See pp. 1-2 of FG's Response and Comment 158

See Comment 159
The statements in the paragraph at the top of page 313 are wholly conclusory. The facts, data, information and economics upon which these statements are made should be set forth.

On page 314, slight reference is made to the fact that the granting of water right reservations could eventually cause the consumptive use of Montana water on the Yellowstone to be lost to downstream states. This statement seems to confine this effect to instream uses, but it would also be applicable to proposed consumptive uses under water right reservations when beneficial uses in downstream states were perfected before the beneficial uses were perfected in Montana for the waters thus reserved. Other states are not required to recognize, under the law, reservation of water rights in Montana, whether consumptive or nonconsumptive, whether instream or for purposes of future diversion. The net result of granting applications for reservation of waters which contemplate uses in the distant future such as for the years 2,000 and 2,007 may be that the water will be wholly lost to Montana for any consumptive use, regardless of the purposes of the reservation. This, of course, is true, from the very beginning, of reservations for instream uses. What is the impact of such a possible loss of water?

See P. 2 of FG's Response and Comments 8 and 153

On page 319 it is said:

"Significant irrigation expansion in the Tongue and Powder river subbasins would require the cost of providing additional, major water storage facilities on these rivers. These structures would be too expensive to justify for irrigation purposes alone."

This being true, the cost of such structures as it reflects upon the cost of irrigation and of providing for irrigation waters must be considered, particularly in view of the DNRC regulations which require economic feasibility to be a factor before even processing applications for water reservations.

What alternative sites were considered for Moorhead Dam and Reservoir other than the one proposed by the DNRC in its application No. 9941-r? The environmental impacts of using alternative sites should be set forth and described in the EIS. See Comment 160

What would be the market for industrial water from Moorhead Dam and Reservoir as proposed by the DNRC in light of the DNRC's statement in its application that the project is only economically feasible if a large part of the conservation storage can be marketed for industrial water purposes? This being so, what is the impact of the use of the water for industrial purposes? This should be fully discussed. A discussion should be made in the EIS of the developments referred to and outlined in the reconnaissance report which is submitted in connection with the DNRC application No. 9941-r. These refer to, among other things, and for example, to the location of 25 hydrogenation plants and 10 or more thermal electric plants in the Powder and adjoining Tongue River basins by the year 2,020. The application states: "An increased population of as much as a half million people is visualized for the area." The impact of development of this kind (including socio-economic), as described in the reconnaissance report, should be discussed and evaluated and a detailed statement made thereon. See Comment 142

The environmental impact of Moorhead Reservoir with a surface area of about 18,200 acres, with a maximum width of about one mile and extending up the Powder River about thirty miles, as discussed on page 11 of the reconnaissance report attached to the DNRC application for Moorhead, should be stated.

The environmental impact should be stated for irrigation facilities used in connection with Moorhead Dam including pumping plants, diversion facilities, and distribution facilities. See Dr. 2 of FG's Response
Discussion should be had of proposed fish and wildlife enhancement, caused by Moorhead Dam as proposed by the DNRC.

Attached to application No. 9941-r, is a reconnaissance report of the recreation aspects of the Moorhead Dam and Reservoir as prepared by the United States Department of Interior under date of February, 1968. This lengthy report and the environmental impact aspects of it should be considered, stated, and discussed. On page 17 of that report, as attached to application No. 9941-r, it is said:

"Before project construction, it is recommended that a survey be conducted of the area to determine the possible presence of archaeological values."

This aspect of the project should properly be stated and discussed in an EIS, along with historical values.

It is indicated in an attachment to application No. 9941-r, i.e., the letter dated October 12, 1967, of the Fish and Wildlife Service of the United States Department of Interior, page 3:

"The reservoir will extend about 29 miles into Wyoming at the top of the flood control pool."

There should be a discussion of whether this is agreeable with Wyoming, and what steps have been taken to secure Wyoming's agreement. Otherwise, the project appears speculative and thus contrary to the regulations of the DNRC which prohibit the processing of speculative applications.

The proposed reservoir site as contemplated in application No. 9941-r, will obviously have considerable environmental impact upon wildlife, and that environmental impact should be stated and discussed. As stated in the report of the Fish and Wildlife Service, as attached to application No. 9941-r, among other things:

"Construction of Moorhead Reservoir will result in a significant loss of wildlife habitat, especially mule deer range."

This should be discussed and the impact stated. The Department of Fish and Game of the State of Montana in its letter dated September 28, 1967, suggested that appropriate mitigative measures should be recommended to avoid excessive environmental impact on game animals, and these mitigative measures should be discussed.

In general, the DEIS does not consider the proposals made by the DNRC in its application to build Moorhead Dam and Reservoir, and this is a significant deficiency in the DEIS, and it should be

amplified to fully include all of the matters referred to in that application and attached papers.

The environmental impact of the project features, including the diversion, distribution, and irrigation facilities of the projects proposed by Powder River Conservation District No. 9943-r, North Custer Conservation District No. 9947-r, Department of State Lands Nos. 9931-r, 9933-r and 9934-r, and Prairie County Cooperative Grazing District No. 9946-r, should be considered, discussed and stated.

An explanation should be given of statements in the DNRC

application for Moorhead Dam and Reservoir, No. 9941-r, as follows:

1. It is said in Item 3 of the application attachment:

"The actual uses for the reservation waters have not been stated. Until the benefit/cost analyses for the Moorhead Dam and Reservoir facilities are completed, it will not be possible to determine the costs to the user and ability to pay."

Please explain how an Environmental Impact Statement can be written for a project without including a benefit/cost analyses so that the same can be studied prior to the time the application is submitted for approval to the Board of Natural Resources and Conservation.

Please explain how the economic feasibility of the applications of the Powder River, Prairie County and North Custer Conservation Districts can be determined without knowing the cost of Moorhead water to them.
See Comment 161

2. Also, in Item 3 of the attachment it is said that a majority of the water would have to be marketed for industrial use purposes but that if a high enough price for industrial water could

be obtained, dependent upon the demand for the same, this would enable such uses as agriculture to be subsidized. Please explain and give the facts upon the demand for industrial water, what the impact would be from the use of such industrial water, and how an Environmental Impact Statement can be written for such an uncertain situation, which uncertainty would include the applications of the Powder River, Prairie County and North Custer Conservation Districts.

3. In Item 4 of the attachment, it is said: See Comment 162

"* * * the reservation request is submitted based on this stated amount (75,000 acre-feet for Montana's share of the Yellowstone River Compact water), subject to the condition that the Department reserves the right to amend its application at any time prior to the Board of Natural Resources and Conservation action on the reservation application, to reflect more current and specific information."

Please explain how an Environmental Impact Statement can be written with any degree of specificity for an application that may be materially amended. The application is being submitted to the Board for approval, and the EIS must accompany the proposal through the agency processes so that it receives consideration. If changes are made in the application as stated in Item 4, the intent of MEPA and the rules and regulations promulgated thereunder is totally defeated. The DNRC is the sponsor of this application and is the preparer of the EIS. Therefore, please relate what amendments are proposed to be made by the DNRC, and what the environmental impact of the amended application would be.

4. In Item 7 it is said:

"The extent of future needs, the types of uses, and their magnitude are presently indeterminate."

Please explain how the intent of MEPA can be met, and the regulations promulgated thereunder without setting forth, in an EIS, the types of uses contemplated for the water, and the magnitude of the water which would be used, and at least, a reasonable estimate upon the extent of future needs. Please, also, comment upon the other statements made in Item 7 of the application as to the uncertainty of what the water will be used for, the actual needs for the water, etc. Also, in Item 7 of the attachment it is said:

"Construction of facilities for storage, diversion, conveyance and use cannot be initiated; additional studies are needed to determine engineering, economic and financial feasibility, and to assess environmental impacts."

How can an EIS be written at this time, for consideration in connection with the proposed approval by the Board based upon the February, 1977 hearings, when it will not be possible to assess environmental impacts until additional studies are made. Please, in light of this statement, comment upon the application in relation to the text of Natural Resources and Conservation administrative regulation No. 36-2.14R(1)-51440 wherein such statements are made as:

"Plans for the construction of the diversion, conveyance and application facilities shall be prepared to a level of detail necessary to adequately define their size and function. The intent of this criteria is to demonstrate that the applicant is not speculating on the

use of reserved water, but rather has reasonable and established plans for the construction of a water resource project or projects. The plans shall be prepared and documented to the highest degree of detail possible, and accompanied by maps or drawings showing the project locations, place of water use, point or points of diversion, and other relevant information.

* * * The economic feasibility of the project or projects shall be discussed. The project should be a financially feasible undertaking. The applicant should furnish documentation that will support the economic feasibility of the project. * * * Further, each project will be considered on its merits as a viable development project and as a worthwhile investment undertaking."

The foregoing are requirements to be contained within the application and under administrative regulation 36-2.14R(1)-S1420 it is provided that:

"An application will not be processed by the Department and acted upon by the Board until it is complete and in compliance with the Act and these rules."

Inasmuch as we are dealing with an application of the DNRC, and this DEIS is written by the DNRC, please indicate why this application, which is obviously not in compliance with the rules above noted, can be processed. Also, please indicate how such a speculative application can be used as a basis for writing an EIS which would be useful or within the meaning and intent of MEPA, and rules and regulations promulgated thereunder.

5. Inasmuch as the applications of the Powder River Conservation District, No. 9943-r, the Prairie County Cooperative Grazing District, No. 9946-r, and the North Custer Conservation District, No. 9947-r, are inextricably dependent upon the DNRC application for Moorhead, please indicate how those applications

can comply with the rules above noted and how an EIS can possibly be written for such speculative applications.

GENERAL COMMENTS ON WATER RESERVATION APPLICATIONS

For the following comments, the page numbers and the paragraph upon the page in which the commented statements appear are first noted and identified, and then the comment follows.

Page 2, last paragraph. "The 1967 Legislative Assembly directed . . ." Question: Is this an environmental impact report for water reservation applications or is it the framework of, or comments upon, a state water plan? See Comment 163

Page 5, second paragraph. "Because of the relatively scarce water supply . . ." Question: If this is the case, why aren't

these two applications involving those two subbasins reviewed in detail in separate or site specific environmental reports?

See Comment 164
Page 6, sixth paragraph. The report states that it is possible

that certain individual water reservations as proposed will result in significant environmental impacts. In addition, allocating Yellowstone Basin water through a combination of these reservations would have basin-wide cumulative affects which must be identified.

Consequently, this EIS examines not only the anticipated impacts of each proposed reservation, but also the generalized regional impacts that would occur through approval of such a combination.

Comment: The EIS does not identify the specific anticipated impacts of each proposed reservation. Neither does it give a clear view of the general regionalized impacts except on two main parameters: reduced flow and total dissolved solids in the water.

Page 6, seventh paragraph. "Because 30 applications are

involved" Comment: If this is a programmatic statement, it must follow that individual impact statements must be written for each of the applications for reservation of flow. This EIS does not treat each application in enough detail for an independent analysis of impacts. See Comment 78

Page 9, third paragraph. 1975 level depleted flows are now available and could be included to provide a comparison with 1970 flow records. See Comment 91

Page 10, first paragraph. The methodology for environmental evaluation of impacts is purportedly explained in the summary. The summary also says that because of the vastness and diversity of the basin, analysis and planning were done on the Yellowstone basin and nine hydrologic subbasins. Question: What was the basis for picking these subbasins? Exactly how was the computer model used to predict monthly subbasin outflows for all conditions that could occur with the water reservation applications? The methodology should be explained in enough detail for a layman to understand and make an independent judgment as to its validity. See Comment 86

Page 10, second and third paragraphs. An introduction to the computer model is made. Documentation and reference, with summation tables, should be provided to permit investigation and substantiation of the procedures. Comment: The basis for environmental impacts are to be considered either primary or secondary and primary impacts are those associated with the river system itself. Considering such features as monthly stream flows, water quality, channel form, aquatic and riparian wildlife habits, secondary impacts are those

which are not necessarily of lesser importance, but are effects associated with the use of water. Question: Why are not other criteria used for evaluating impacts, mainly impacts on air, water, noise, cultural environment, socio-economics, land use and groundwater? See Comment 142

Page 10, seventh paragraph. Projects identified in the conservation district requests are not necessarily firm commitments for future development. It goes on to say "that in most cases individual landowners are not even aware that their lands are included. Each conservation district application is based on a reconnaissance soil survey which involves the general evaluation of land features for preliminary planning of irrigation development. As such, each survey's applicability should be restricted to a determination of the general extent, location and quality of irrigable areas." Question: If this soils survey was so general in scope, how can a reasonable determination be made of the land available for irrigation for each conservation district? See DPs 2-3 of FG's Response and Comment 166

Page 12, fifth paragraph. This paragraph indicates that Moorhead Reservoir and depletions may cause "Major increases in Total Dissolved Solids." Comment: Actually, the depletion of 124,000 acre-feet of water annually from the Powder River could do this only if used for irrigation, the return flows from which would not be suitable for other uses, would violate water quality standards, would preclude continued use for municipal purposes, and would eliminate the entire fishery in that river; if, however, the depletion was consumed for coal conversion, water quality in the lower Yellowstone and Missouri River would be improved.

Page 13, second paragraph. The EIS states that "large benefits would accrue to water quality, fish and wildlife, and recreation values. Although very difficult to quantify in dollars, these benefits all have substantial economic value." Comment: If these benefits are substantial, they should be quantified regardless of the difficulty of quantification. Economic analysis in an EIS is mandated under MEPA by House Joint Resolution 73 (1974) and the dissent in the Beaver Creek South Supreme Court case (No. 13179, December 30, 1976). See p. 3 of FG's Response and Comment 42

Page 13, fifth paragraph. It is assumed that the potential loss to irrigators of \$7,700,000 is an annual loss. If so, then the reservation of water for fish should have to have even a greater value. If a visitor day, recreation day, or fisherman day is assumed to be worth \$3, then it would generally follow that 2,560,000 recreation days would be needed annually before serious consideration could be given to granting a reserved flow for fish.

Page 13, seventh paragraph, et seq. Concerning the application for reservation of 6,643,000 acre-feet annually for Montana Department of Health and Environmental Sciences, the implication is that when flows lower than this amount are encountered, there would be a violation of State Water Quality standards. Under such assumption, what action is proposed to guarantee the availability of this amount in lower-flow years? A reservation would not alleviate low-flow conditions; only a new storage could accomplish that objective. See Comment 167

Page 15, third paragraph. A "high level of energy development" is assumed. Justification is lacking for this assumption.

Page 19, fifth paragraph. The EIS states that "Any new cultivation in the basin would attract migratory water fowl, and would probably increase the number of geese and ducks stopping to feed along the rivers. Decreased flow and degraded water quality would cause significant impacts to the aquatic eco-systems of the Tongue and Powder Rivers, with major effects in the Tongue River fishery." Comment: There is no evaluation of the impacts on the wildlife in the area caused by increased irrigation and elimination of habitat. See Comments 168 and 142

Page 19, eighth paragraph. In the Energy Emphasis Alternative there is no mention of the secondary impacts or socio-economic impacts much less a cost/benefit analysis. See Comment 169

Page 21, sixth paragraph. The EIS states that "Energy development, especially if conversion plants are constructed, would have an impact on the social and cultural systems as sparsely populated, agrarian areas become transformed into populated, industrial centers. Negative impacts to the natural environment, some of which may be extensive and of a long time, would also result." Comment: The statement should be quantified and a more detailed analysis provided to allow an informed observer to judge the impacts for himself.

Page 22, third paragraph. The narrative deals with the determination of optimal quantities of water to leave in the river. If methodologies were used to ascertain these flow rates for the two See Comment 142

See Comment 70
Large applicants, those methodologies should be identified.

Page 23, second paragraph. The EIS states that "Water developed for energy will help commit Montana's coal reserves to extraction, an irreversible commitment of a non-renewable resource. The instream flow applications, on the other hand, might reduce the water available for energy development, slowing the growth rate, and extending the lifetime of the basins' coal reserves." Comment: This is a self-serving statement and does not directly address itself to the important issue of irreversible and irretrievable commitment of resources in the basin. See Comment 171.

Page 46, fifth paragraph. It is probable that the phenomenon of changed channel morphology in the Bighorn River was not caused entirely by reservoir construction on that stream; the dominant flow rate has not been changed because use of the water has not increased, even though water storage has made assured supplies available for further development. See Comment 172.

Page 55, Table I-7. Salinity Hazard for Irrigation Waters.

Comment: The table presents the salinity hazard but does not refer directly to the origin of the table or how it was developed. See Comment 47.

Page 56, Table I-8. Salinity Hazard for Freshwater Communities. See Comment 60

Comment: This table is not explained in detail or directly refer-

enced. In addition, a statement is made that comparing Tables I-7 and I-8 it may be seen that the salts and sensitivities of irrigated crops and aquatic eco-systems are similar. In looking at the two tables and comparing them the similarities are not so obvious.

Page 85. Cultural Environment. One paragraph is devoted to archaeology and on page 86, there is one table that also is devoted to archaeological sites. Comment: Nowhe in the rest of the impact statement are impacts on archaeology of this massive development and water reservation applications discussed. See Comment 142.

Pages 94 - 103. Economics in the basin are discussed, however this discussion of economics is not used in the impact statement to describe socio-economic costs or benefits. See Comment 142.

Page 107, Tables I-24, I-25 and I-26. There is great disparity between existing and future irrigation needs. Existing irrigation diversions of 6 acre-feet per acre and an allowance of only 3 acre-feet per acre for future irrigation needs a complete and satisfactory explanation. Return flow estimates are similarly in wide disparity. See Comment 2.

Pages 123 - 129. The state water planning model is described generally. This model should be described in enough detail for laymen to understand the inputs and outputs of the model and how they affect the impacts described in the report. See Comment 86.

Page 136, third paragraph. This paragraph describes farm budget analysis and explains the fact that the analysis was used to determine the economic feasibility of potential conservation district projects. Comment: Due to the importance of this farm budget analysis, it should be explained in more detail. See Comment 173.

Page 154, fourth paragraph. This paragraph states that "Increasing numbers of migratory water fowl may be attracted to the new irrigated fields for feed, especially in the eastern portion of the Yellowstone basin, which lies in the important Central Flyway."

See Comment 142
Comment: There is no explanation of the effect on wildlife upon lands near the streams used for new cultivation and irrigation.

Page 154, seventh paragraph. This paragraph states that "According to the data submitted in the reservation application, benefits would exceed costs of proposed projects in all cases; thus the proposals are economically feasible." Table III-16 summarizes project profit information, and the trade centers which would primarily profit from these effects on the county employment. Comment: This table does not contain enough information to make an independent analysis of the economic feasibility of the reservation application for the conservation districts. See Comment 174

Pages 191 and 192. This section explains the environmental impacts of the Fish and Game Commission application including generalized impacts and primary impacts. In this section it is stated that the intention of this reservation request is to maintain the status quo of the critters, wildlife, wildfowl and vegetation in the Yellowstone basin. Comment: Considerable time and effort has apparently gone into studying the effects of reducing the flow in the Yellowstone River basin to the same critters, wildlife, wildfowl and vegetation. However, nowhere in the impact statement is contained the results of the studies that were used to determine what effect reduced flow would have on the basin. See Comment 175

Page 195, first paragraph. This paragraph states that the cost of developing alternative water supplies could be estimated if a location of development were known. (Location of development refers to industrial development.) Comment: There is not enough detail in the impact statement to determine any of the costs or benefits.

Pages 231 and 232. The levels of irrigation development and the rationale used to determine irrigable lands are generally discussed. Comment: This entire discussion is not detailed enough to the layman to determine whether or not the methodology used is adequate. See Comment 176

Page 236. Table IV-7 shows, by county, the "feasibly irrigable acreage" for which water reservations are proposed to the year 2000. A study of the corresponding narrative to describe the many units which comprise the 237,472 acres, reveals that about 26 new storage sites would be required to implement the proposed developments. Economic development would be less feasible with the required new storage, and the difficulty of justifying new reservoir construction would seem to preclude these units. Comment: Only some 30,000 to 50,000 acres could be developed without new storage, such as the land on Bighorn River below Bighorn Lake and on the main stem of the Yellowstone proper. Thus, if the Board of Natural Resources was inclined to judge the probable magnitude of irrigation for which water should be preserved, then something less than 50,000 acres would be a more reasonable number than the entire 237,472 acres. See Comment 177

Page 242. Under Primary Impacts of the no action alternative, the impression is given that all projects would go forward if this alternative were taken, regardless of the feasibility. Comment: Common sense would dictate that this is not the case. See Comment 178
Page 243. The secondary impacts of the no action alternative are discussed. The first paragraph states "Under this alternative,

water would generally be available for consumptive uses such as irrigation, municipal, domestic and industrial." The last paragraph under the heading also states that "The dollar value of these losses would be substantial, but impossible to determine because contemporary methods of analysis are inadequate and because it is not known with certainty how much degradation will take place in the future." Comment: An environmental impact statement is supposed to make a judgment decision on the impacts and not just write it off as being almost impossible to determine. See Comment 179

Page 263. Table IV-11 describes 90th percentile low flow--historical and simulated. Comment: There is not enough information in the report to determine how those figures were calculated for the simulated condition. See Comment 103

Page 269. Table IV-12 contains essentially the same information and the same comment can be made of this table.

Page 273, third paragraph. The statement is made that "No quantitative analysis has been done, but it is likely that dewatering that would result under all levels of irrigation development projected would result in extreme diurnal dissolved oxygen deficits."

Comment: In the environmental report there is no information available that would allow an independent determination of those oxygen deficits. See Comment 180

Page 274. There is no indication of the criteria used for determining impacts on the fishery. See Comment 181

Page 276. Municipal and Domestic Water Use as well as Industrial Water Use. Comment: The implication is that technology is not

available for making saline water suitable for municipal and domestic water, but technology is available for making it useful for industrial purposes. This is an erroneous assumption. See Comment 182

Page 283, sixth paragraph. In this paragraph it is stated that "The construction of Moorhead Dam would make a great deal of water available. However, even at the low projected level of development the quality of the water would be unacceptable for irrigation at least one year out of two." Comment: What criteria was used to determine why the water would be unacceptable for at least one year out of two? See Comment 183

Page 286, third paragraph. There is conflict between the two sentences which explain salt balance and then show a salt pickup from irrigation return flows. See Comment 184

Page 290. Under Instream Flow Emphasis Alternative three paragraphs are devoted to something that each individual Montanan will have to decide for himself. Obviously this paragraph was written by somebody who enjoys the amenities within Montana, but it does not necessarily hold for every individual Montanan. In a similar nature on page 302 under recreation and aesthetics, the statement is made that "The instream emphasis alternative if implemented, would tend to maintain the status quo with respect to recreation and aesthetics. This may be considered a future benefit in that, if recreational experiences and aesthetic perception were degraded by industrial and agricultural development, those large and real values would be foregone." Comment: Nowhere in the environmental report is the reviewer able to make an independent determination that the large and real values referenced here

would be foregone. The statements are wholly conclusory and present the self-serving opinion of the author. See Comment 185.

Section 76-108, R.C.M. 1947, sets forth the powers of conservation districts. In this connection, subdivision (3) provides as follows:

(3) To carry out preventive and control measures and works of improvement for flood prevention and the conservation, development, utilization, and disposal of water within the district, including, but not limited to, engineering operations, range management, methods of cultivation, the growing of vegetation, changes in use of land, and the measures listed in subsection C of section 76-102, R.C.M. 1947, on lands owned or controlled by this state or any of its agencies with the co-operation of the agency administering and having jurisdiction thereof, and on any other lands within the district upon obtaining the consent of the occupier of such lands or the necessary rights or interests in such lands; (Emphasis ours)

The EIS indicates that the consent of the occupier of the lands has not been obtained, nor has the district acquired the necessary rights or interests in such land. Indeed, the EIS says that many of the landowners do not even know their land is being proposed for use of water right reservations sought by the districts in question. Isn't the preparation of the Environmental Impact Statement, and the holding of hearings upon the conservation district applications, under these circumstances and in light of the foregoing law, an exercise in futility until such time as the district has the power to develop and utilize the water for which the reservations are applied for?

DATED this 12th day of January, 1977.

INTAKE WATER COMPANY

By Henry Loble, one of its attorneys

RECEIVED

JAN 12 1977

ONT. DEPT. OF NATURAL
RESOURCES & CONSERVATION

Clayton's WRP
Lindsay BH.

Jan. 18 1977

Ont. Dept of Natural Resources & Conservation
Water Resource Dept. (Environmental Impact)
Helena Mont

Dearlemen:

I am a farmer and rancher of the pioneer era: I live in Prairie County area: I attended the impact meeting held in Glenside Mont a week ago today. Jan 3

I am in favor of extending the nototiorian as it concerns me and others like me we have live stock and are too busy taking care of some in the severe weather and cant do every thing at the same time to comply with set dead lines.

See Comment 136

I feel the irigatable area in acres of Prairie county is reduced too much. Prairie county is mostly a live stock producing area, we need the irigated land to produce the hay needed for live stock especially in dry seasons.

I noticed Tennaco who got its foot in the back door now refuses to give an impact statement as to their operations and how they will effect our environment.

This is an indication to me that they would not be very inviting to our eastern Mont area and would cause resentment and unfavorable ~~not~~ response. I feel Tennaco should do their business by way of the front door as all us Montanans are doing. if we accept any of the out of state Industrial Interests I feel that we should know whether they comply with our environmental standards and do not cause problems that the industrial states have and are hard to get rid of.

I am a native Montanan I am not against Industrial development I favor agriculture development first as we are an agricultural state and we farmers laid the main foundation of our state. I want to see Montana remain beautiful and clean and prosper and to help our other states with their needs I believe ~~to~~ in going slow with our water and our natural resources so we do not find our selves with undesirable problems to cope with. Thank you. Yours truly Jerry Su

CITY OF LIVINGSTON

Livingston, Montana 59047

Office Of:
CITY ATTORNEY
103 West Callender

January 10, 1977

RECEIVED

JAN 14 1977

MON, DEPT. OF MINING
RESOURCES & CONSERVATION

Department of Natural Resources
Mr. Gary Fritz, Hearings Officer
32 South Ewing Street
Helena, MT 59601

Re: Statement for Inclusion in Hearings
on the Draft Environmental Impact
Statement for Water Reservation
Applications in the Yellowstone River Basin

Dear Mr. Fritz:

Officials of the City of Livingston have noted several deficiencies that they would like considered in the Draft Environmental Impact Statement for Water Reservation Applications in the Yellowstone River Basin. It is requested that this letter be included as a formal part of the hearings record on the Environmental Impact Statement.

See Comment 186

The first primary concern is that the Environmental Impact Statement simulates future population almost solely in terms of coal and energy related development. The error in this approach for at least the Upper Yellowstone area is reflected in Table A-5 at page 407 where a population increase of zero is predicted for the Upper Yellowstone area under all levels of development. The City of Livingston strongly disagrees with this assessment of population increase and resulted increase in water depletion is noted in Table A-5. It would seem that this Table was calculated for use in one of the coal-related studies and made no determination as to how the population would be impacted by other types of development or factors.

The error in simply taking studies of population increase in full related studies and applying those studies to the Yellowstone River Basin as a whole is apparent. Particularly in the Upper Yellowstone and Clark's Fork portions of the Yellowstone River there have, in recent years, been an impact upon population in the upper direction due to the fine recreation and healthful environment that the area now offers. This trend is consistent with the nationwide population trends of persons desiring to live in the less populated rural areas.

Department of Natural Resources
Mr. Gary Fritz, Hearing Officer
Page Two
January 10, 1977

With a steady growth from the recreational element plus continued steady growth from agricultural and business communities, the Upper Yellowstone area, including the City of Livingston, will experience significant population increases independent from goal related development. It is also noted that Table A-4 does not include a population simulation for the City of Livingston. It should be noted as to any efforts toward future simulation might use the 1970 United States Census figure, and the City of Livingston has a serious dispute with the methodology employed in the figures reached in that census.

A more basic area of concern to municipal officials is the ability of future municipal systems to satisfy demands for residential and business purposes. Officials of the City of Livingston would strongly urge a priority reservation system as noted at Page 313, allowing municipal reservations priority over other reservations. This policy would simply recognize that, under any development alternative, the basic municipal water needs must be met for a healthful environment. Particularly with the minimal amounts of reserved water requested as compared to other applications, the priority municipal reservation would be a sound investment to satisfy human needs, including those water needs for a healthful and sanitary environment.

Secondly, on Page 295, the effects of the instream alternative upon municipalities are discussed. In this description it should be noted that not only would cities probably have to find alternative sources, but those alternative sources might not be available. In addition, it should be noted, that costs would rise a great deal in this situation to try to find acceptable alternative sources or to develop storage facilities.

Thank you for your consideration of these concerns.

Very truly yours,



ROBERT L. JOVICK
Acting City Attorney

RLJ:kk

PART V
RESPONSES TO COMMENTS ON THE
DRAFT EIS

INTRODUCTION

Oral comments on the Draft EIS were received at public hearings held in Glendive, Miles City, Billings, and Livingston on January 4, 5, 6, and 7, respectively; written comments were mailed to the DNRC in Helena or presented at these hearings. This section presents both types of comments and the responses to those comments.

Only comments which discuss the Draft EIS are presented here. Each such comment is summarized and followed by a response. Some comments were made by several parties; to avoid duplication, these are summarized and answered only once.

Comments which solely express support or opposition to certain reservations have been noted, but are not summarized or answered. Similarly, some of the written comments have not been evaluated, since they either represent opinions or do not address aspects that materially affect analyses presented in the EIS.

The four public hearings were recorded on tape, and notes were taken by two DNRC employees. Because tape recordings of the hearings are lengthy, reproducing complete transcripts here is not practical.

In many cases, the response to a comment is merely: "Comment noted." This may mean that the comment is one which DNRC acknowledges to be valid and sound. Or it may mean that the comment is an opinion with which DNRC may or may not agree. In either case, it is felt that no response is necessary, but the comment is thought to be relevant and of interest to the reader.

RESPONSE TO ORAL COMMENTS

COMMENT 1. Inadequate time was allowed to review the Draft EIS.

Response. The normal 30-day period was allowed for review. Providing additional time would have unduly stressed the ability of the Board to act on water reservations before the end of the moratorium.

COMMENT 2. A depletion rate of two acre-feet per acre (af/a) for future irrigation is too low.

Response. Irrigation depletion rates vary, depending on the crops grown, climatic conditions, and irrigation system efficiency. However, assuming that a large percentage of the new irrigation will be by sprinkler systems, two af/a is an appropriate basinwide average.

The tables on pp. 107, 108, and 109 indicate a depletion of 2.8 af/a for existing irrigated lands. Many existing irrigation projects in the Yellowstone Basin divert large quantities of water (four to six af/a), thereby increasing consumption (through evaporation, deep percolation, and phreatophyte use) and total depletion.

COMMENT 3. The criteria used to assess the economic feasibility of new irrigation, as well as to derive the Irrigation Emphasis Alternative, are too restrictive; the irrigation potential as set forth in the conservation districts' applications is more realistic. Specifically mentioned were the 160-acre plot size supposedly used in determining irrigation feasibility and the viability of the Haidle farms in Prairie County.

Response. The levels of irrigation development in the Draft EIS merely present a range of future possibilities. Assumptions used in deriving the low, intermediate, and high levels were based on two years of study and professional judgment.

A 160-acre plot size was not used in the feasibility determination of new irrigation; rather, a 320-acre farm was assumed. Some future projects may, of course, be larger, and others smaller.

According to DNRC calculations, the Haidle farms located on the Fallon Bench are just beyond the limit of financial feasibility. Analysis based on the lower interest rate used in the conservation districts' applications (six and eight percent, compared to the 10 percent used in the Irrigation Emphasis Alternative) would result in the Fallon Bench area being considered feasible to irrigate. Different economic assumptions create different results.

Also see comment 12.

COMMENT 4. The Fish and Game Commission's water reservation request is too large.
Response. This comment, received a number of times during the hearings, is an opinion. See also p. 6 of the Department of Fish and Game (FG) response.

COMMENT 5. The Draft EIS is too long, too technical, and too detailed for the lay person to understand.
Response. Efforts were made, in preparing the Draft EIS, to discuss all necessary topics adequately and to write in terms most lay persons would understand--without oversimplifying the issues involved.

COMMENT 6. The instream flow values cited by the Fish and Game Commission and the Department of Health and Environmental Sciences are important and should be maintained.
Response. This comment, also received a number of times during the hearings, is an opinion.

COMMENT 7. DNRC applied for water reservations in the Yellowstone Basin and also prepared the Draft EIS, creating an apparent conflict of interest.
Response. Often a governmental agency, whether state or federal, must prepare an impact statement for an action (e.g., a timber sale) that the agency also proposed. In this case, the law requires DNRC to prepare the EIS and allows DNRC to apply for water reservations.

COMMENT 8. If any reservations are approved for instream flow, usable water will be lost, flowing to downstream states.
Response. Water need not be diverted to be used. Instream flow for fish and wildlife represents a beneficial use under Montana water law. See pp. 313 and 314 of the Draft EIS for further explanation.

COMMENT 9. August is an important month for irrigation, and, if water is not available during that time, crops may be lost. Since the Fish and Game Commission's request would make water unavailable during this month, in some years the impact would be very severe, particularly to cash-crop operators.
Response. See p. 6 of FG's response.

COMMENT 10. Reservations of water for irrigation are needed because agriculture does not have the capital resources to expand as rapidly as industry.
Response. Comment noted.

COMMENT 11. Certain uses of water are more important than others. Montana needs a system which establishes preferences among the various uses so that water will be available for the most important uses in dry years.
Response. This comment, received numerous times during the hearings, is an opinion.

COMMENT 12. The irrigation scenarios presented in the Draft EIS vary considerably from the conservation districts' water reservation applications. This may invalidate the Draft EIS.

Response. The assumptions used by DNRC in determining the economic feasibility of future irrigation are compared to those used by the conservation districts below.

1. DNRC limited potential water sources to the Yellowstone River mainstem and the four major interstate tributaries. The conservation districts' applications included lands along several other tributaries, notably the Shields River and Sweet Grass Creek.

2. The DNRC evaluation considered only individual development, while the conservation districts' applications considered the economies of scale for group project development.

3. The DNRC analysis used a 10 percent interest rate compared with the rates of six and eight percent used in the conservation districts' analyses.

4. The DNRC evaluation used Bureau of Reclamation pumping cost data, which may be conservative.

5. The DNRC evaluation was limited to the DNRC land classification; the conservation districts' applications may be based on other criteria.

The acreages involved do vary considerably in some counties. However, the impacts of the conservation districts' applications and those of the DNRC's scenarios are both evaluated, creating, in the Draft EIS, a complete analysis.

Also see comment 136.

COMMENT 13. To allow further study, the Yellowstone Moratorium should be extended -- either until the State Water Plan is completed, or until the water rights adjudications in the Yellowstone Basin are completed.

Response. Comments noted. These comments were received numerous times during the public hearings.

COMMENT 14. The Draft EIS should have evaluated effects of depletions on downstream states.

Response. The study area for the Draft EIS was the Yellowstone Basin in Montana; consequently, effects in downstream states are beyond the scope of the EIS.

COMMENT 15. Water from Fort Peck Reservoir should have been examined as an alternative source to supply industrial needs in the Yellowstone Basin. Transporting coal to Fort Peck Reservoir is another alternative.

Response. These alternatives, while perhaps valid, are beyond the scope of the EIS.

COMMENT 16. Decisions on water reservations must be based, in part, on considerations of future generations.

Response. Comment noted.

COMMENT 17. Historical flow records may not be extensive enough to reliably establish flow patterns. Therefore, plans based on these records could be erroneous.

Response. Flow records of considerable length are available for some streams in the Yellowstone Basin. More years of record on some streams would certainly be desirable. However, the existing information, even if imperfect, must suffice if decisions must be made before more complete data become available.

COMMENT 18. Irrigation and instream flow reservations are compatible.

Response. Comment noted.

COMMENT 19. Better water management could make more water available for new irrigation use.

Response. See p. 305 of the Draft EIS.

COMMENT 20. Water available for irrigation only seven years out of ten is inadequate for an economical irrigation operation, especially when the high cost of new systems is considered. Therefore, the Fish and Game Commission's request would preclude new irrigation.

Response. Some irrigation water would be available in all years, although in three years out of ten (on the average) only a partial water supply would exist. Presently, irrigators remain in business, even though they receive less than a full water supply in some years. Irrigators of cash crops, however, probably would need nearly a full water supply to stay in business. See also p. 6 of FG's response.

COMMENT 21. Storage has not been included as part of the Fish and Game Commission's request for instream flows; yet, if the requested flows are to be maintained in all years, storage would be required.

Response. The intent of the Fish and Game Commission's request is not to augment low flows, but rather to prevent more frequent occurrence of those low flows due to increased depletions. See also p. 7 of FG's response.

COMMENT 22. Water is not available in the Clarks Fork Yellowstone River to support new irrigation.

Response. Water is available, in most years, for new irrigation along the Clarks Fork Yellowstone. Storage would make even more water available for irrigation use.

COMMENT 23. Keeping the Yellowstone River in a free-flowing state benefits the quality of life and has economic value through recreation.

Response. Comment noted. This opinion was received numerous times during the hearings.

COMMENT 24. Indian closure of the Bighorn River would put additional recreation pressure on the upper Yellowstone.

Response. Comment noted.

COMMENT 25. Industry should be required to store water offstream and to clean and cool water before returning it to the stream.

Response. Comment noted.

COMMENT 26. A statewide standard should be established for maintenance of minimum streamflows.

Response. Comment noted.

COMMENT 27. Water storage in upper Yellowstone tributaries was examined in the 1960's. This alternative should be re-examined, because that storage could benefit irrigators and aquatic life.

Response. If properly sited and maintained, these small upper basin reservoirs could be beneficial to irrigators and aquatic life. See also p. 7 of FG's response.

COMMENT 28. Contrary to the statement on p. 135, conservation district programs are not all voluntary. Examples would include land use and streambank protection regulations.

Response. Comment noted.

COMMENT 29. Contrary to a statement on p. 197, existing irrigators would not benefit from instream flow reservations because they would have to periodically defend their water rights against instream claims to water.

Response. Existing water users may have to defend their water rights periodically even if instream flows are not approved. In the absence of a flow reservation, the unappropriated waters may be claimed through the permit process.

COMMENT 30. A statement in the first paragraph on p. 320 should be changed; water reservations could have a major (rather than minor) effect on the growth of municipalities.

Response. Municipalities will probably receive adequate water supplies regardless of water reservations.

COMMENT 31. It will be difficult to modify an instream flow reservation at a later date, even though the Board has that authority.

Response. Comment noted.

COMMENT 32. Because it is difficult to foresee water needs, some unappropriated water should be left for future unspecified uses.

Response. Comment noted.

COMMENT 33. The Yellowstone region has had a declining human population, due to lack of jobs. Instream reservations would prevent a reversal of this trend.
Response. Table I-21, on p. 101 of the Draft EIS indicates that the long-term trend of declining populations in the Yellowstone Basin has been reversed since 1970, and that the population is now increasing. It is evident, however, that many of the employment gains which would result from increased irrigation could be curbed by the proposed instream reservations. Unless the increased employment benefits from recreation can equal the potential employment gains foregone in agriculture, instream reservations could dampen the expansion of new employment opportunities.

COMMENT 34. The Draft EIS should consider federal and Indian claims to water.
Response. The Draft EIS did mention these undetermined rights and stated the impossibility of quantifying them at this time. However, any reservations approved by the Board will be junior in priority to those rights.

See also comments 68, 70, and 131.

COMMENT 35. One solution to water supply problems is dams; the costs of offstream storage may not be as prohibitive for irrigation as implied in the Draft EIS.
Response. Comment noted.

COMMENT 36. Because fish have survived historic low flows, the Fish and Game Commission should not request so much water.
Response. Historical low flows have had an adverse impact on the aquatic environment. Near average or greater flows in subsequent years, however, have enabled these systems to recover. The Fish and Game Commission's request is intended to prevent more frequent occurrence of those low flow events which, if not followed by near average or greater flows, would degrade the aquatic ecosystem. See also p. 6 of the FG response.

COMMENT 37. The Draft EIS inadequately treated social and cultural impacts of water reservations.
Response. As described on p. 123 of the Draft EIS, emphasis was placed on the primary impacts to the river system itself and the secondary impacts resulting from the use of the water. See comment 142 for a general discussion of socio-cultural impacts.

COMMENT 38. The Draft EIS states that the impacts of energy development are enormous, but fails to specify whether those impacts are positive or negative.
Response. The numerous impacts of energy development in eastern Montana have been described in many reports and impact statements. Nevertheless, debate continues as to whether large-scale energy development would create a net positive benefit or a net negative cost to social and environmental conditions in Montana.

COMMENT 39. The Draft EIS did not adequately examine the effects of irrigation return-flow on river salinity.

Response. On the contrary, a detailed analysis, using the State Water Planning Model, was performed for each application and alternative.

COMMENT 40. Irrigation from Flathead Creek will not adversely affect the fishery there.

Response. This would be true only if sufficient instream flows are provided. See also p. 6-7 of the FG response.

COMMENT 41. Early-season irrigation benefits fish by providing return flows during low-flow periods later in the year.

Response. It is true that return flows from early-season irrigation augment flows during the late summer and fall. Often, however, these late season flows are diverted and depleted, dewatering the stream to a level below that needed for a healthy aquatic ecosystem. See also p. 7 of the FG response.

COMMENT 42. Several comments were made to the effect that the economic analysis is inadequate and biased because the monetary value of the benefits was neither estimated nor defined. Further comments asked whether the \$7,700,000 (p. 13) is an estimate of annual costs or cumulative costs, and noted that on p. 193 of the Draft EIS these losses were cited as \$7,312,500.

Response. The correct figure is \$7,700,000, which is the estimated upper limit of the annual costs (from irrigation opportunities foregone) of the Fish and Game Commission reservation in the year 2000.

The omission of an estimate of the benefits of this reservation is not due to bias or oversight, but to the fact that (unlike the costs) the benefits defy a quantitative evaluation.

The recreation benefit from instream reservations equals the value to recreational users of preventing the reduction in the quality of recreational experiences which would result if flow and water quality levels were decreased. In simple terms, it is the value people place on preventing a decline in the quality of their recreational activities, which is measured by what they are willing to give up in order to prevent that decline. The amount they are willing to give up is called their "willingness-to-pay." The value of recreational benefits can be estimated by observing what people do in fact give up in order to get this value. However, to calculate the recreation and amenity benefits of an instream flow reservation requires three steps:

1. The difference between the flow levels and water quality levels that would occur with the reservation and those that would occur without the reservation must be identified and described. The effects of the reservation on fish populations, stream depth, flow rates, and water quality must be known.

2. Next, the impacts of these flows and quality levels on recreational activities must be determined. Knowledge of the effects of flows and water quality levels on fishing success, scenic qualities, and boating is essential.

3. Finally, the value recreational users place on these changes must be estimated. For example, how important to fishermen is the prevention of a decline in fishing success?

The value of recreational experiences is the amount recreational users are willing to pay for the experiences. The willingness-to-pay for each recreational activity must be estimated for the quality of experiences that would occur with the instream reservation, and then for the quality of experiences that would occur without the reservation. The differences between these two values, when summed for all recreationists and all recreational activities, would be an estimate of the recreational value of the instream reservation.

The benefits of an instream reservation to consumptive users such as irrigators, towns, and industries are the lowest of 1) the damages which could result from dewatering and degradation but which are prevented by the reservation, or 2) the costs incurred in preventing that damage. For example, benefits to irrigators of water quality maintenance would be the lowest of 1) the decline in yields that are prevented by the reservation if leaching could not have avoided the drop in yields, or 2) the leaching costs not expended because water quality levels are maintained.

Future leaching costs incurred by irrigators and water treatment costs incurred by towns and industries (that would be unnecessary if the reservation were granted) could also be calculated and counted as benefits. Other benefits to consumptive users include the additional pumping costs that are avoided because instream reservations maintain flow levels.

Although the data needed to estimate all benefits of instream flow reservations are neither available nor obtainable, the \$7,700,000 estimate of the upper limit of the annual cost of the reservations in the year 2000 is still useful. When making a decision on the Fish and Game Commission's reservation request, the Board will decide whether the potential unquantified benefits are greater than the potential costs.

COMMENT 43. Several comments indicated that the income multiplier (2.1), used to estimate the regional secondary benefits, is too low.

Response. This income multiplier means that one additional dollar of income to farmers will create \$2.10 of additional income to other businesses within the region. This ratio of primary income benefits to secondary income benefits was estimated in "An Input-Output Model of the Montana Economy" (Haroldsen 1975, cited on p. 409 of the Draft EIS). At present, no better estimate of the ratio is known though higher factors are often claimed.

COMMENT 44. The Fish and Game Commission's reservation request, if approved, will restrict agricultural and industrial development, thereby limiting expansion of the tax base; the ultimate effect will be to increase the tax rate.

Response. Instream reservations would have wide-ranging effects on population, employment, and the relative development of agricultural, recreation, and other industries. Evaluation of the net impact of all of these factors on taxes is beyond the scope of the Draft EIS.

RESPONSE TO WRITTEN COMMENTS

Yellowstone-Tongue A.P.O.

COMMENT 45. Page 15. Water quality may be a limiting factor under the No Action Alternative.

Response. See pages 16, 248, and 278-282 of the Draft EIS; Table IV-15 shows that even a low level of irrigation development would increase the salinity of the Powder Subbasin outflows to unacceptable levels.

COMMENT 46. Page 21. The probability of increased salinity decreasing the per acre yields of crops should be included under "long-term productivity."

Response. DNRC agrees, and this section in the Final EIS Summary now includes a mention of this impact. Indeed, long-term productivity may decrease if salt accumulates in the root zone of the soil. Careful water management (leaching) may preclude or mitigate this problem, however.

COMMENT 47. Page 55. The 'Salinity Hazard for Irrigation Waters' data differ from that given in USDA Handbook No. 60.

Response. The comment notes apparent discrepancies between Draft EIS and Agricultural Handbook No. 60 (Richards, L. A., ed., 1954. Diagnosis and improvement of saline and alkaline soils. USDA. Washington, D.C.).

It must be recognized, as noted in the Draft EIS (p. 55) that each soil-plant-water system varies with respect to its response to salinity. Therefore, any irrigation salinity guide must be somewhat flexible and must recognize that absolute, rigid limits cannot be set.

Table I-7 (p. 55 of the Draft EIS) is adapted from: Klarich, D. S. 1976 (September). Baseline water quality inventory of significant surface waters in the Yellowstone River Basin of Montana. Water Quality Bureau, Department of Health and Environmental Sciences. Billings. Unpublished photocopy.

Klarich consulted Handbook 60, but also used more recent information, for example:

McKee, J. E. and Wolf, H. W., eds. 1974. Water quality criteria. 2nd ed. Publication 3-A. California State Water Resources Control Board. Sacramento.

Allison, L. E. 1964. Salinity in relation to irrigation. Advances in Agronomy 16:139-180.

Hem, J. D. 1970. Study and interpretation of the chemical characteristics of natural water. 2nd ed. USGS Water Supply Paper 1473.

COMMENT 48. Page 117. Is there a possibility that the Indian water rights will have a quality as well as quantity stipulation?

Response. It is conceivable that Indian water rights may include water quality standards.

COMMENT 49. Page 118. Based on average annual flow at the state line?

Response. Assumptions used by Wyoming in deriving these values are unknown. The Yellowstone Compact percentages apply to streamflows at the mouths of the four tributaries.

COMMENT 50. Page 154. The statement, 'Irrigation return flows will be saline but will be adequately diluted. . .' is questionable. It will be difficult to dilute saline water with water already in the USDA's medium or high salinity category.

Response. Missing from the comment is ". . . by the flow of the larger streams." Where this is not true, the specifics are discussed elsewhere in the Draft EIS.

COMMENT 51. Page 173. The Billings request seems excessive. The rationale behind the requests should be investigated.

Response. The applicant was asked for additional data; however, none was provided. See pages 3-8, City of Billings response.

COMMENT 52. Page 177. Why did the DNRC apply for so much water in the Tongue and Powder Rivers? Does the firm yield for Moorhead include evaporation, existing uses, and instream flows?

Response. The application is for the total storage capacity of each reservoir. The firm yield of 124,000 af/y (75,000 af/y of which is assumed to be available for Montana) for Moorhead is water in excess of existing rights and evaporation losses. Minimum flows for water-quality purposes are not assumed.

COMMENT 53. Page 233. Showing lands to be feasible to irrigate does not mean that water is available to irrigate them.

Response. Feasibility, as used in this table, means the financial feasibility determined through farm budget analysis and does not imply that water is available to irrigate these acres.

COMMENT 54. Page 281. In the Powder River, can it be documented that the watershed, not the bed and banks of the stream, is the primary source of transported sediment?

Response. The bed and banks of the Powder River channel predominantly consist of sand-sized particles. A majority of the transported sediment is suspended particles, silt-sized and smaller.

COMMENT 55. By virtue of the Yellowstone River's B-D₃ water quality classification, the DHES application on the mainstem must be approved to prevent depletion below the requested flows.

Response. This statement by YTAPO and DHES constitutes a legal opinion which at this time has not been held by any court of competent jurisdiction.

Dave Stiller, NPRB EIS Team

COMMENT 56. The EIS places too much emphasis upon potential ground-water reserves in the Madison Group.

Response. DNRC did not intend to convey an optimistic viewpoint in reference to the ground-water potential of the Madison Group. This viewpoint parallels that of DNRC, as indicated on page 59, paragraph 2 of the Draft EIS.

Montana Department of Health and Environmental Sciences

COMMENT 57. The DHES application would allow for storage of spring flows in offstream reservoirs. Irrigators may be able to afford this storage cost.

Response. Water costs from offstream reservoirs will generally be more than \$50/af. In addition to this cost the farmer would have to pay water conveyance and distribution costs.

COMMENT 58. The expansion of irrigation depends on factors other than the availability of land and water.

Response. DHES objects that markets for the additional agricultural production were not considered and that the increase in supply could lower prices. A decline in prices resulting from increased production would reduce the estimate of losses. This objection is valid. A more complete analysis would consider the effects on prices of the increase in supply. A decline in prices resulting from increased production would reduce the estimated increase in profits from the new irrigation and reduce the estimate of losses imposed on irrigation by instream reservations. It is unlikely that the gradual expansion of irrigation described in the EIS would seriously depress prices.

COMMENT 59. DHES feels that the expansion of irrigation that would be precluded by the DHES application is not as beneficial as estimated because an expansion of irrigation in the Yellowstone Basin may be accompanied by a contraction elsewhere and the costs of this contraction were not considered.

Response. There are two reasons why expansion in the Yellowstone Basin is not likely to reduce irrigation elsewhere:

1. Granting reservations for irrigation does not grant a subsidy or competitive advantage to the recipients. They are only assured that in the future water will be available. They receive no competitive advantage that will aid them in outproducing or underselling their competitors.

2. The demand for agricultural products is increasing both nationally and internationally. This increase in demand probably means that irrigation both in the Yellowstone and elsewhere can profitably expand at the same time.

It is true, however, that expansion of irrigation in the Yellowstone Basin may mean that expansion elsewhere would be less than it would be otherwise. Expansion elsewhere, displaced by expansion in the Yellowstone Basin, would presumably be a higher cost operation. Perhaps a better measure of the costs of instream reservations, then, is the difference between the expense of this higher cost agriculture and the expense of proposed irrigation in this basin. Evaluation of irrigation outside the basin and the impacts of water reservations outside the basin are beyond the scope of this EIS.

COMMENT 60. What is the source of Table I-8, p. 56 of the Draft EIS?

Response. Like Table I-7, Table I-8 was adapted from Klarich (1976), cited in the response to comment 47. Klarich cited the following publications:

Hart, W.B., Doudoroff, P., and Greenbank, J. 1945. The evaluation of the toxicity of industrial wastes, chemicals and other substances to fresh-water fishes. Waste Control Laboratory. The Atlantic Refining Company of Philadelphia. Philadelphia.

Ellis, M. M. 1944. Water purity standards for fresh-water fishes. Special Scientific Report No. 2. U.S. Department of the Interior. Washington, D.C.

COMMENT 61. Even without the instream reservations of the Fish and Game Commission and the Department of Health and Environmental Sciences, there may be conflicts between existing and future irrigators because of water-quality degradation and lowered water levels.

Response. In certain areas, during low flow months and years, future irrigation development could adversely affect existing irrigators. These existing irrigators, however, are presumably protected by the 1973 Montana Water Use Act which directs DNRC to deny water use permits where existing rights would be adversely affected, as well as by water quality statutes which (subject to judicial interpretation) would prevent water-quality degradation.

Orval S. Ellison, Montana Representative, House District No. 73

COMMENT 62. "Inasmuch as the Department of Fish and Game has requested one of the larger reservations, I am concerned about the propriety of so much reliance being placed on this agency's data."

Response. The DNRC often relies on data supplied by applicants, both governmental agencies and private parties, if the DNRC feels the information is fair and the best available. The Fish and Game data used in preparing this EIS met this criterion.

Montana Water Development Association--M. E. Eddleman (two letters)
C. R. Beitman (one letter)

COMMENT 63. "In accordance with the 30-day objection period under the Water Use Act, the Montana Water Development Association objects to the Moratorium and Regulations regarding applications for reservations of water in the Yellowstone Basin as they are discriminatory and therefore appear to be unconstitutional." Response. The statement that the Moratorium and Regulations regarding the applications for reservation of water in the Yellowstone Basin are discriminatory and therefore appear to be unconstitutional is a speculative legal opinion. The DNRC must implement the statutes as enacted by the legislature until a court of competent jurisdiction rules otherwise.

COMMENT 64. "The Yellowstone River Compact must be considered in the reservation and apportionment procedure."

Response. Wyoming's share of the interstate tributary streams was considered in the hydrologic simulation of water reservation applications and alternatives. Exact quantification of these rights cannot be accomplished at this time,

although it is clear that Montana should not reserve water belonging to Wyoming, and water reservations will be conditioned on protecting those rights.

COMMENT 65. ". . . The Fish and Game application. . .(will deprive) beneficial uses within the state of Montana."

Response. Instream flows requested by the Fish and Game application would constitute a beneficial use, as provided in the 1973 Montana Water Use Act.

COMMENT 66. "The procedures do not give an individual irrigator or farmer or rancher an opportunity to file a request for future development nor does it allow industry or the federal agencies to also make application for water through a reservation."

Response. Individuals and industrial users are not prevented from applying for a beneficial water use permit falling within the storage and flow limitations set by the Moratorium. Federal agencies are empowered to make application for water through a reservation once the moratorium expires. See also Comment 67.

United States Department of the Interior, Bureau of Land Management

COMMENT 67. "In that the Montana Water Use Act denies the federal government and private sector the opportunity to declare future water needs, the impacts of reservation granting cannot be adequately assessed. In fact, your document acknowledges a shortage of information on amount and location of industry needs (page 195). The same is true of needs for federal land and mineral management programs."

Response. The Montana Water Use Act does not deny the federal government the opportunity to declare future water needs. Section 89-890(1), R.C.M. 1947, provides "the United States or any agency thereof, may apply to the Board to reserve waters for existing or future beneficial uses, or to maintain minimum flow, level, or quality of water throughout the year or at such periods or for such length of time as the Board designates." Furthermore, the federal government has water rights of its own and can apply for water rights under Montana water law. However, Section 89-8-107, R.C.M. 1947, provides that the United States or any agency thereof may not apply for a reservation of water in the Yellowstone Basin until the end of the Yellowstone Moratorium or until a final determination of existing rights in the Yellowstone Basin is made pursuant to the Montana Water Use Act (whichever comes first).

COMMENT 68. "The impacts related to large-scale granting of water reservations to state subdivisions cannot be adequately evaluated until the federal and Indian reserved rights are quantified. These reserved rights predate and therefore hold precedent over any water reservations granted under the Montana Water Use Act."

Response. The Draft EIS indicates that pursuant to Section 89-890(5), R.C.M. 1947, any reservations granted by the Board should not adversely affect rights in existence at the time of Board action. If a court of competent jurisdiction determines that federal and/or Indian reserved rights were in existence at the time of the granting of any reservations by the Board, such Board approved reservations may be held to be subject to any such senior federal and/or Indian reserved rights. At this time, however, any allegations of the status or quantity of such federal and/or Indian reserved rights constitute speculative legal opinions.

COMMENT 69. "Preparation of this EIS draft and its review is taking place before the reservation objections are reviewed. . . All objections (should) be resolved before the preparation of this EIS draft, as the objections themselves represent conflicts that must be covered in the EIS."

Response. Both MEPA and the Water Use Act mandate an evaluative role for DNRC in considering water reservations. The Department recommendations to the Board must consider both the findings of the EIS and the objections under the Water Use Act. Because of this, the fact that the EIS may not anticipate all objections under the Water Use Act or that the EIS review precedes the Water Use Act hearings is unsequential.

COMMENT 70. "The state seems to be circumventing its own established legal process. The 1973 Water Use Act provides for court adjudication of water rights in the state; the state has assigned Yellowstone Basin as first priority. As of this date, adjudication of the first drainage in the basin (Powder River) has not been completed. Further, it is our understanding that the Water Rights Bureau is encountering some difficulty in identifying and quantifying established water uses that predate the 1973 Act. This shortcoming is acknowledged on page 5. In view of this paucity of knowledge regarding existing rights, it is unrealistic to expect an adequate assessment of impacts resulting from granting of the reservations. Quantification of existing rights established by historical use and of federal and Indian reserved rights should precede preparation of this EIS."

Response. DNRC is not circumventing any expressed statutory provision or agency rule by preparing the EIS pursuant to statute and in accordance with duly promulgated agency rules, even though adjudication of existing federal and/or Indian reserved rights in the area has not been finally determined by any court of competent jurisdiction. No such statutes or rules expressly require prior adjudication. At this time the allegations as to agency circumventing of established legal processes or as to the quantity or status of existing historical, federal and/or Indian reserved rights constitute speculative legal opinions.

COMMENT 71. "A primary impact of the Fish and Game reservation is stated (in the Draft EIS) as '. . . maintain water quality. . . by limiting agricultural and industrial development which could pollute streams' (page 192). We (BLM) submit that this is a negative approach to problems related to industrial development."

Response. It is the function of an EIS to identify impacts, and this EIS fairly describes what DNRC considers to be a primary impact of the Fish and Game Department reservation. DNRC believes that the public and decision makers should be informed of both negative and positive impacts of proposed actions.

COMMENT 72. "Due to the fact that the reservation applications have not been acted upon by the State, . . . this document does not address a single proposed action. . ."

Response. Each of the 30 applications for water reservation requires action by the Board. The purpose of the Draft EIS is to identify, among other things, the impacts of granting, denying, or approving in modified form these applications. By its very nature, an EIS is an advisory document that is produced before action is taken, and, while an EIS may recommend a prescribed course, it is not required to do so. In any case, impacts associated with the specific

action of granting each application are addressed in the EIS as it is a programmatic review of cumulative effects of the applications taken as a whole. Alternatives addressed provide valuable reference points for an almost unlimited number of proposed action options available to the Board.

COMMENT 73. "It appears the state is attempting to expedite this statement in order to meet the Yellowstone Moratorium deadline. . ."

Response. The Yellowstone Moratorium was intended to allow for time to act on reservation requests for future beneficial uses. DNRC does not deny trying to meet the moratorium deadline. Both the Draft and Final environmental impact statements have been subjected to the short time frames between receipt of the reservation applications on November 1, 1976, and the expiration of the moratorium on March 10, 1977. However, legal deadlines for distribution, review, and comment on the impact statements have been and will be met.

Rosebud and Treasure Conservation Districts

COMMENT 74. Irrigation does not substantially increase salt (TDS) concentrations in return flows and receiving streams.

Response. It has been well established, after many years of research and field observations, that irrigation waters leach salts and nutrients from the soil and deliver them to receiving waters, either in ground water or streams. See, for example:

Branson, R. L., Prah, P. F., Rhoades, J. D., and Oster, J. D. 1975. Water quality in irrigated watersheds. *Journal of Environmental Quality* 4(1):33-40.

Water Resources Scientific Information Center. 1975. Irrigation return flow. Office of Water Research and Technology, U.S. Dept. of the Interior. Washington, D. C.

In the Powder Subbasin, streamflows are naturally saline. Water development for irrigation or any other use which might increase salinity must be considered carefully. See also comment 154.

Utah International, Inc.

COMMENT 75. The distribution of the Draft EIS violates MAC, Section 16-2.2(2)-P2040 (RuTe V), subsection (4) (a).

Response. The DNRC has adopted and does comply with rules implementing the Montana Environmental Policy Act. Rule V, regarding preparation, content, and distribution of impact statements is found in MAC, Section 36-2.2(6)-P240 (Rule V), not in the cited rules governing the Department of Health and Environmental Sciences. In any case, copies of the Draft EIS were sent to Utah International, Inc., and to Poore, McKenzie, Roth, Robischon, and Robinson, P. C., via first class mail on December 13, 1976, the date of transmittal to the Governor and EQC. The 30-day comment period began December 14, 1976, and ended January 12, 1977 (dates inclusive). In that a copy of the EIS was mailed and Utah International, Inc., was aware of the EIS, as evidenced by its representation at the Billings public hearing (Jim Edgerley) as well as receipt of its comments on the EIS within the 30-day period, DNRC feels all requirements of the law have been met.

COMMENT 76. The EIS fails to state whether the Governor of the State of Montana designated DNRC as the lead agency as provided in Section 69-6518(6), R.C.M. 1947.

Response. DNRC and its Board have the sole responsibility for accepting and acting on applications for reservations of water. Water reservation applications evaluated in the EIS are not perceived by the Department nor by the applicants to constitute a single combined facility because place and type of beneficial use vary in each application. Because DNRC is the only state agency involved, no lead agency designation is required under provisions of the cited statute.

COMMENT 77. The Draft EIS fails to comply with MAC, Section 16-2.2(2)-P2040 (Rule V).

Response. Again, DNRC has not adopted the cited rules which are applicable to the Department of Health and Environmental Sciences. DNRC has adopted MAC, Section 36-2.2(6)-P240 (Rule V) regarding preparation, content, and distribution of environmental impact statements, and all requirements of these rules have been met.

COMMENT 78. The Draft EIS violates Section 69-6504(3) and (4), R.C.M. 1947, because it "is more programmatic in nature than a detailed analysis limited to a specific project" and therefore DNRC has failed to comply with the requirements of a draft EIS. . . and has failed to draft an EIS which fulfills the function of a draft EIS.

Response. DNRC's overall department rules implementing the Montana Environmental Policy Act provide in MAC, Section 36-2.2(6)-P270 (Rule VIII) for programmatic environmental impact statements. It is there stated: "If the Board or Department is contemplating a series of actions, programs, or policies which, in part or in total, will constitute a major action significantly affecting the quality of human environment, the Department may prepare a programmatic environmental impact statement discussing the impacts of the total series of actions." Water reservation applications, requiring approval by the Board, are deemed by the Department to constitute such actions.

In addition to a programmatic evaluation, the Draft EIS also evaluates the impacts of each individual application (pp. 125-217) taken separately based upon information both contained in each application as well as collected or generated by the Department, other state agencies, or independent researchers. The Department produced the EIS through procedures outlined in MAC, Section 36-2.2(6) and sees no conflict between these procedural rules and applicable portions of MEPA (Sec. 69-6504(3) and (4), R.C.M. 1947).

COMMENT 79. "On pages 1 and 2 the following comment appears: 'The priority date of any new water right subsequently approved will reflect the original date of application. However, any water reservation approved by the Board prior to the approval of the permits will have a preference of use over the permits.' This comment is obviously a misstatement of the law. We (Utah International) filed duplicate applications with the DNRC for Powder River water pursuant to the Yellowstone River Compact on November 20, 1973. These filings, being file nos. 1004, 5, and 6 s42J, were given a priority date of November 20, 1973, by the DNRC. The Yellowstone River Basin Moratorium Act (Sec. 1, et seq., Chap. 16, Laws of 1974; Section 89-8-103, et seq., R.C.M. 1947)

not enacted until 1974, thus subsequent to Utah's priority date. Pursuant to Section 89-891, R.C.M. 1947, the priority of Utah's right, when granted, will relate back to November 20, 1973. Thus, it would be totally unconstitutional and taking of property without due process of law for any reservation application filed subsequent to November 20, 1973, to have a priority date over Utah's application."

Response. The quoted Draft EIS statement appears to be a correct statement of the existing provisions of both Sections 89-891(2), R.C.M. 1947, and 89-8-105(2), R.C.M. 1947. Such statutes clearly provide that the priority of a Beneficial Water Use Permit dates from the filing of the application for such permit with the Department, and that a reservation established before any such Beneficial Water Use Permit is granted will be deemed to be a preferred use, so that if such permit is granted, such permit shall be issued subject to the preferred reserved use. The allegation that Utah International will be granted a permit and the allegation of unconstitutionality and taking of property without due process of law are at the present time speculative legal opinions.

COMMENT 80. "On page 2 of the application (sic) appears the following statement: 'The 1967 Legislative Assembly directed that a state water plan be developed for Montana to guide future water use. That water plan, not yet completed for the Yellowstone Basin, is scheduled to be finished by mid-1978. However, many of the options available under the water plan may be accomplished or foreclosed through the decisions on reservation requests. Hence, the Board's action may, at least in part, constitute the framework of the state water plan.' This statement totally ignores Article IX, Section 3, 1973 Constitution of Montana, and the provisions of the Montana Water Use Act, Section 89-865, et seq., R.C.M. 1947, which contemplate that private individuals, corporations, and entities retain the right to apply for and appropriate for beneficial uses of state waters."

Response. The allegations of unconstitutionality and statutory inconsistency are at the present time speculative legal opinions.

COMMENT 81. The statement (p. 5-DEIS), "There is not enough water . . . to satisfy all reservation requests . . . it is not presently known exactly how much unappropriated water is available," illustrates the EIS is premature and no major state action can be effected.

Response. "Because of the size of the Yellowstone Basin, the large number of water right filings, and the field work involved in investigating water right claims, adjudication of the entire basin will probably take many years. Therefore, water reservations acted upon by the Board will be subject to the eventual adjudication of all prior existing rights" (p. 116, Draft EIS; also Sec. 89-890(5), R.C.M. 1947). In addition, analysis of instream flow data allows a reasonable estimate of unappropriated water in each subbasin. To delay action on water reservations is to accept by default the No Action Alternative and its consequences. If the No Action Alternative is pursued by the Board, DNRC prefers it be considered by choice, not by default.

COMMENT 82. The Draft EIS does not substantiate the predictions that additional irrigation in the Powder subbasinis economically feasible, is needed, and is likely to occur.

Response. The applications by the three conservation districts in the Powder Subbasin demonstrate preliminary economic feasibility on the proposed lands when additional water is available. The existence of profitable opportunities for investment in new irrigation justifies a prediction that new irrigation is needed and likely to occur.

COMMENT 83. "On page 20, the following statement is made: 'It should also be noted that commitments of water made through reservations would probably have the effect of discouraging speculative permit applications in the future, regardless of a specific beneficial use involved.' Speculative permit applications are hardly possible under the Montana Water Use Act, since the Act and Constitution of the State of Montana require that water be applied to a 'beneficial use,' and the DNRC may set the time limits within which the diversion facility must be completed. Section 89-880, R.C.M. 1947, and Section 89-886, R.C.M. 1947."

Response. Perhaps "speculative" should read "prospective." However, as printed in the Draft EIS, the statement is literally correct in that commitments of water made through reservations would probably have the general effect of discouraging prospective permit applications, including "speculative" permit applications (which would in any event tend to fall under the criteria for permit approval delineated at Section 89-885, R.C.M. 1947).

COMMENT 84. The Draft EIS does not include a discussion of the construction of one or more offstream reservoirs as an alternative to Moorhead Dam.

Response. The number of alternatives to the reservation applications is infinite; however, DNRC has to select a finite number of alternatives in order to produce a meaningful document. The idea of providing storage at sites offstream of the Yellowstone mainstem was briefly mentioned, but offstream sites in the Powder Subbasin were not.

The comment includes several pages on the advantages of offstream sites in the Powder. That discussion, though understandably not complete, has considerable merit.

COMMENT 85. The Draft EIS understates the probable level of water use for energy and industrial purposes in the Powder Subbasin (28,150 af/y with the high level of energy development in 2000). In addition, the construction of Moorhead Dam, as proposed in the DNRC application, will only be economically feasible if most of the yield of 1,150,000 acre-feet of storage is sold to industrial uses.

Response. The estimate of 28,150 af/y (corrected in the Final EIS to 22,600 af/y) refers to industrial use in Montana. Wyoming's share of Moorhead water could be marketed in the Gillette area of Wyoming with the consent of the other two signatory states of the Yellowstone Compact and Montana's share in the Powder Subbasin in Montana. Estimates of the location of future industrial plants are obviously highly tentative at this time.

Montana Power Company

COMMENT 86. Documentation, references, and explanation of the State Water Planning Model should be provided.

Response. The State Water Planning Model is a mathematical model programmed for operation on a digital computer.

The model may be applied to any area but preferably to a hydrologic basin or subbasin. In this case, nine planning subbasins were chosen. The ability of the model to accurately mimic a basin depends on the availability of hydrologic data for that basin. Such data include long-term records of streamflows into and out of the basin, temperature, precipitation, soil moisture, and water diversions and depletions, especially by irrigated agriculture. These data are not always available but, in some cases, may be synthesized using the data available and correlated data from nearby areas.

The model uses a set of balance equations to account for the movement of water within the basin. For example, rainfall is distributed among evaporation, soil moisture, ground water, and streamflow. The output of the model is the series of monthly (or yearly) streamflows, for the period of record of the hydrologic data, at the mouth of the basin.

Calibration refers to the process of adjusting the numerous coefficients in the model so that a known series of streamflows may be closely predicted. In the simulation phase of model operation, a hypothetical situation may be assumed. For example, the precipitation data may be altered to simulate a weather modification program. Or, in the case of the Draft EIS, several water development situations were hypothesized. In any case, the basin outflows which would result from the hypothesized situation are predicted.

The State Water Planning Model is complex and cannot be readily understood without a great deal of study. The following documents, available from DNRC, explain the model's philosophy, its structure, and its mode of operation:

- Boyd, D. W., and Williams, T. T. 1972. Development of a state water planning model. Part I. Methodology. Montana University Joint Water Resources Research Center. Montana State University. Bozeman.
- Boyd, D. W., and Williams, T. T. 1972. Development of a state water planning model. Part II. Peripheral models of the Yellowstone basin. Montana University Joint Water Resources Research Center. Montana State University. Bozeman.
- Boyd, D. W., and Williams, T. T. 1972. Development of a state water planning model. Part III. Peripheral models of subbasin 43-Q of the Yellowstone basin. Montana University Joint Water Resources Research Center. Montana State University. Bozeman.
- Williams, T. T., Boyd, D. W., and Brustkern, R. L. 1973. Development of a state water planning model. Part IV. Data preparation. Montana University Joint Water Resources Research Center. Montana State University. Bozeman.
- Stanfield, D. I., Jr., and Moore, W. H. 1973. Development of a state water planning model. Part V. Data bank operators manual. Montana University Joint Water Resources Research Center. Montana State University. Bozeman.
- Boyd, D. W., Williams, T. T., and Brustkern, R. L. 1973. Development of a state water planning model. Final Report. Montana University Joint Water Resources Research Center. Montana State University. Bozeman.

Also see comment 114.

COMMENT 87. The Draft EIS fails to explain why it was assumed the Energy Emphasis Alternative would be essentially the same as the No Action Alternative. Response. Page 289 of the Draft EIS briefly explains that assumption.

Energy companies have already applied for more water than is projected to be used under the high level of energy development. It is reasonable to assume, therefore, that if water is made available for energy development by denying competing water reservations, then water availability for energy companies will only be constrained by the physical limitations of the hydrologic system (and existing water rights). This situation, which is essentially the No Action Alternative, is the same as the Energy Emphasis Alternative.

The agricultural industry is at a competitive disadvantage, with respect to water, to the energy industry. Irrigated agriculture is being developed by a number of small, independent operators, while energy development will be done by a smaller number of large corporations having more capital available for rapid expansion and for high-priced water supplies. Therefore, it is reasonable to assume that if energy development proceeds at a high level, irrigation development would be constrained to an intermediate level.

COMMENT 88. "Page 17, paragraph 5, implies that agriculture is more than an economic interest but, in fact, molds the lifestyle of the region. It further states, based on the above assumption, that it may prove desirable to reserve a quantity of water to protect and expand agriculture. We (Montana Power Company) are surprised to find that the DNRC considers lifestyle molding a beneficial water use."

Response. DNRC holds to its statement that agriculture is more than just an important economic activity in the Yellowstone Basin but also molds the lifestyle of the region. The Draft EIS states that it may prove desirable to reserve a quantity of water for increased future irrigation and not for the purpose of molding lifestyles.

COMMENT 89. The Draft EIS contains no discussion or estimate of the losses to industrial development that would result from instream reservations. Response. When instream reservations preclude industrial withdrawals from the rivers, these costs are the difference between the costs to industrial companies of getting water from the rivers and the costs of the next cheapest alternative. However, they are impossible to estimate at this time because the number, size, and water requirements of future plants are not known.

COMMENT 90. "Page 23, under the discussion of energy materials, the statement is made that, 'Water developed for energy will help commit Montana's coal resources to extraction, an irreversible commitment of a nonrenewable resource. The instream flow applications, on the other hand, might reduce the water available for energy development, slowing the growth rate and extending the lifetime of the basin's coal reserves.' If it is the purpose of the Yellowstone Water Reservations to control energy development or industrial development under the guise of a low profile, esoteric water permit procedure, it should be so stated and a second impact statement should be prepared."

Response. It is the purpose of an EIS to identify impacts resulting from agency actions. The general statement quoted in the above comment is an attempt to describe the possible irreversible and irretrievable commitments of resources under various alternatives.

The Montana Legislature's intent in passing the Yellowstone Moratorium (Sec. 89-8-103, et seq., R.C.M. 1947) is referred to on page 1 of the Draft EIS.

COMMENT 91. The information on page 9, paragraph 3, and page 49, paragraph 6, seems to use 1970 data.

Response. During preparation of the Draft EIS only 1970 level of development streamflow values were available. The Bureau of Reclamation has since published the 1975 level of development flows, as summarized below:

<u>Stream</u>	<u>Annual average runoff (af) 1975 level of development</u>
Yellowstone River near Livingston	2,755,270
Stillwater River near Absarokee	699,810
Clarks Fork River at Edgar	752,820
Yellowstone River at Billings	4,994,090
Bighorn River near St. Xavier	2,367,580
Tongue River at Miles City	314,080
Yellowstone River at Miles City	7,930,750
Powder River near Locate	423,420
Yellowstone River near Sidney	8,345,120

Source: Yellowstone River Basin and Adjacent Coal Fields. 1976. Depletion study. 1975 Level of development. USDI, Bureau of Reclamation.

COMMENT 92. The average annual flow of West Rosebud Creek (p. 107) should reflect the most current records.

Response. The average annual flow as given in the 1975 Water Resources Data for Montana is 97,080 af.

COMMENT 93. The Draft EIS has not discussed return flows of municipal systems.

Response. The Draft EIS (p. 173) points out that the municipal reservation requests do not specify the quantity or quality of return flows. Because of the relatively small (except for Billings) diversions involved as well as the likelihood of the requirement for secondary-or-better wastewater treatment by the year 2000, it may reasonably be assumed that municipal returns will have a minor adverse effect on water quality and dewatering.

COMMENT 94. The potential Yellowtail Irrigation Project (Hardin Unit) is not discussed in the EIS. The effect of the Yellowstone Compact is not adequately discussed.

Response. Sufficient water to irrigate the Hardin Unit has been set aside in Yellowtail Reservoir by the Bureau of Reclamation. This water is not available for other consumptive uses.

The Yellowstone Compact was discussed in several places in the Draft EIS. Possible future Wyoming depletions were subtracted from the four interstate tributary inflows in an attempt to consider Wyoming water use. Absolute compact consideration was not possible simply because the exact quantities of water available to each state are not known.

Montana Department of Fish and Game

COMMENT 95. Page 17, paragraph 2. "Lower Yellowstone aquatic impacts should be listed as primary as well as secondary."

Response. See the definition (p. 123) of primary and secondary impacts. Primary impacts are those on the river system, itself. Secondary impacts relate to the use to which the water may be put.

COMMENT 96. Page 56, paragraph 1. "According to Tables I-7 and I-8, aquatic organisms reach their salinity tolerance levels sooner than do plants and therefore tolerances are not similar."

Response. As pointed out in the text on page 55, Tables I-7 and I-8 are merely guides which indicate the approximate responses of irrigation systems and freshwater aquatic systems to salinity. In that context, the tolerances are similar.

COMMENT 97. What is the validity and source of the statement on page 93, "Paddelfishing is the primary recreation in this area (Two Rivers Region), followed closely by hunting"?

Response. The statement is valid based on recent research conducted by the Montana Department of Fish and Game (Ericksen, M. E., personal communication. Miles City. 1976).

COMMENT 98. Page 105. "Is the vertical legend correct?"

Response. No. Multiply the numbers shown by 10.

COMMENT 99. Page 132. "City of Billings shows 'all the beneficial uses' for their request. How can this include fish and wildlife and recreation?"

Response. The City of Billings did not indicate how the water would be allocated. See also the City of Billings response.

COMMENT 100. Page 135, paragraphs 2 to 4 and 6; page 137, paragraphs 1 to 3; page 138. The Draft EIS has not included, for the conservation district applications, maps and detailed information showing proposed diversion locations, potential diversion amounts, and timetables for implementation. Therefore, adequate evaluation of impacts on aquatic resources is not possible.

Response. This detailed information was too voluminous to include in the Draft EIS. The applications are available from DNRC. The maps which accompanied the applications are available from the conservation districts or their consultants.

COMMENT 101. How many storage sites are necessary to fulfill the water requirements of the proposed irrigation project shown on page 137 of the Draft EIS? Has the cost of storage been included in the cost of these projects?

Response. The Park Conservation District water reservation application did not specify the details of reservoir location or economics.

COMMENT 102. Pages 197 and 198, paragraph 2. "If on the average a good water supply is necessary about 8 years out of 10, then why does the figure depicting upper Yellowstone monthly surpluses show only the surpluses to instream requests for the low flows occurring only once every 10 years?"

Response. The 80th percentile surpluses (water available 8 years out of 10, on the average) are shown in Table III-25 for selected Upper Yellowstone Subbasin streams. Figure III-5 (p. 197) shows 90th percentile surpluses in order to be consistent with the hydrographs used throughout the Draft EIS. It may be inferred from inspection of Figure III-5 that 80th percentile surpluses would be at or near zero for all months except May, June, and July.

COMMENT 103. Page 199, Table III-25. What is the derivation and degree of reliability of the 80th percentile flows?

Response. Some of the streams listed in Tables III-25 and III-27 have or have had gages with varying periods of record:

Boulder River @ Contact	1950 - 1974
Boulder River @ Big Timber	1947 - 1953, 1955 - 1975
Stillwater River @ Absarokee	1935 - 1975
Clarks Fork @ Belfry	1921 - 1975
Rock Creek @ Red Lodge	1934 - 1975
Shields River @ Wilsall	1935 - 1957
Shields River near Clyde Park	1919 - 21, 1929-32, 1934-67
Brackett Creek	1919 - 1921, 1934 - 1957
Sweet Grass Creek @ Melville	1937 - 1969

From the records for these streams, the 80th percentile monthly low flows were calculated and are shown in the tables. These streams were then categorized according to similar topography and climate: Group 1--Boulder River, Stillwater River, Clarks Fork Yellowstone, and Rock Creek; Group 2--Shields River and Brackett Creek; Group 3--Sweet Grass Creek.

For each group of streams, a set of curves was developed by plotting the 80th percentile monthly low flows against the drainage area (on log-log paper). For Group 3, only one stream is present so the curve was defined by the single point and the slope of the other two curves. Then, for each of the ungaged streams, the 80th percentile monthly low flows were taken from the appropriate curve.

For the gaged streams this method is reliable and accurate because the periods of record are long enough. For the ungaged streams, this method is the best available, but can produce results with considerable error. The amount of the error cannot be accurately estimated.

COMMENT 104. Does the farm budget analysis for irrigation feasibility include the cost of storage, if needed?

Response. No.

COMMENT 105. Page 257, paragraph 2, first sentence. Temperature increases could be a problem in the mainstem for the high level of irrigation development.

Response. On page 252, the Draft EIS mentions the problem of temperature increase in the lower Yellowstone mainstem under the No Action Alternative. The problem would be considerably less serious for the Irrigation Emphasis Alternative.

COMMENT 106. Page 258, paragraph 2. "After last sentence add 'However, Kinsey Irrigation District's pump No. 1 requires a minimum of 4,000 cfs to efficiently operate.'"

Response. The North Custer Conservation District has requested an instream flow of 4,000 cfs to protect its pump.

COMMENT 107. Page 265, last paragraph. Would the Tongue Subbasin outflows be near zero in certain months because of storage for summer irrigation?

Response. Yes.

COMMENT 108. The pronghorn distribution shown on Map A-4 is incorrect.

Response. The shaded and unshaded areas on Map 4-A should be reversed.

Park, Sweet Grass, Stillwater, Carbon, Yellowstone, Big Horn, Treasure, Rosebud, North Custer, Powder River, Prairie County, Dawson County, and Richland County Conservation Districts

COMMENT 109. Page 3, Table 1. The application totals for conservation districts do not agree with documentation in the applications.

Response. The only discrepancy was for the Park Conservation District application which should be changed from 752 cfs to 752.6 cfs.

COMMENT 110. Water reservation implementation and control should be discussed since it appears to be a difficult problem.

Response. Conditions or qualifications regarding control of water reservations are decisions the Board must make and do not relate to the impacts of reservations; therefore, they will not be examined in the Final EIS.

COMMENT 111. The farm budget analysis used to evaluate the economic feasibility of the conservation district proposals tends to overstate profitability and feasibility.

Response. Comment noted. Also see Comment 12.

COMMENT 112. The State's irrigation study was used, ignoring the conservation districts' more extensive study, in estimating the environmental impacts of water reservation applications.

Response. The applicants' study was not ignored. The environmental impacts of each application, as received, were reported in the Draft EIS. For the Irrigation Emphasis Alternative, DNRC's more extensive study was used. Maps submitted with the conservation district applications revealed that, in many cases, areas designated for irrigation do not correspond to irrigable lands identified in DNRC's land classification.

COMMENT 113. Page 55. Water quality for irrigation is brushed over lightly; TDS is not a good indicator of water quality; and a more extensive analysis would be desirable.

Response. TDS was used for the water quality analyses because it is the parameter for which the best data are available, because the State Water Planning Model now has the capability to include it, and because the analyses were constrained by time, manpower, and budget limitations. TDS is not a bad indicator of water quality for irrigation; using TDS alone, however, ignores complicating factors as pointed out on page 55 of the Draft EIS.

COMMENT 114. Page 124, paragraph 5. The State Water Planning Model "is not well suited to analyzing environmental effects as well stated in this paragraph."

Response. The above-referenced paragraph does not state that the State Water Planning Model is not well suited to analyzing environmental effects. It merely points out the shortcomings and limitations of the model.

Any model, because it is a simplification of a real system or phenomenon, has limitations and shortcomings. These limitations are acceptable as long as they are understood and not exceeded. The limitations of the State Water Planning Model were carefully and honestly pointed out in the Draft EIS.

DNRC, in addition to using the State Water Planning Model, has investigated several other models that could be used in its place. These include SSARR (Stream Synthesis and Reservoir Regulation) of the U.S. Army Corps of Engineers, HYD-2 of the Bureau of Reclamation, and SYMLD-II of the Texas Water Development Board. Of the available models, it has been concluded that the State Water Planning Model (developed for DNRC by Montana State University) best meets the needs of water planning and subbasin-wide environmental impact analysis in the Yellowstone Basin.

Also see comment 86.

COMMENT 115. Page 157, last paragraph. The Draft EIS did not consider the possibility of reservoirs in the Shields River drainage providing instream flows during critical times. Issue is taken with the statement that the reservation would aggravate dewatering in late summer and fall when the exact opposite could just as easily be the case.

Response. The Park Conservation District application made no mention of providing instream flows. In fact, according to the application, irrigation development in the Shields River drainage is limited by the availability of economic water supplies, not irrigable lands. Therefore, it was assumed that no provisions would be made, if the reservation were granted, for instream flows.

COMMENT 116. Page 158, paragraph 2. There is a misunderstanding as to the determination of instream flows for the Sweet Grass Creek drainage; the paragraph implies that instream flows would be held to 10 percent of average flows on a continuous basis. Minimum flows would often exceed this value. The recommendations of Tennant were used.

Response. It appears, according to the application and attached calculations, that instream flows of up to 10 percent of the monthly average flows would be provided as instream flows, when the actual flows would otherwise be less

than those values. According to Tennant: ". . . 10 percent of the average is a minimum short-term survival flow at best."

COMMENT 117. Pages 159, 160, etc. "These hydrographs do not reflect the positive effects of reservoir storage in August and September. Also, due to lagging return flows from irrigation . . . (the) hydrograph of average flows will increase, not decrease, in the fall and winter months."

Response. The hydrograph for a regulated (at least partially impounded) stream depends on the manner in which the reservoirs are operated. The hydrographs shown in the Draft EIS (e.g., p. 159) are based on operating rules stated in or assumed from the applications.

COMMENT 118. Page 236. Gross evapotranspiration requirements in this area would be closer to 25 inches than 20 inches.

Response. Depending on the crop and location, the gross evapotranspiration requirement may exceed 20 inches. The basinwide average, however, for a variety of crops, is closer to 20 inches than 25.

COMMENT 119. Page 241, paragraph 2. This comments asks, "What effects have historical low flows had upon the aquatic environment," and asserts that the Fish and Game Commission request would provide closer to utopian than acceptable conditions. According to the comment, the Draft EIS leaves unanswered the question of what is an acceptable instream flow regimen.

Response. Historical low flows have had an adverse impact on the aquatic environment. The restoration of near average or greater flows in subsequent years, however, has enabled these systems to largely recover. The Fish and Game Commission request is aimed at preventing an increase in the frequency of those low flow events which, if not followed by near average or greater flows, would degrade the aquatic ecosystem.

The Fish and Game Commission has not requested a utopian situation since, at the current level of development, dewatering is already a problem in some areas. The request merely attempts to maintain the less-than-utopian status quo.

The Draft EIS did not (and, pragmatically, could not) determine the precise level of an acceptable instream flow regimen. The EIS attempted to identify the impacts associated with each of the reservations, as well as a broad set of alternatives to those applications. DNRC feels that enough information is provided for the Board to be able to understand the implications of any action it might take. Also see comment 170.

COMMENT 120. Page 243 to 252. "These impacts as stated need to be supported by facts and contain less conjecture."

Response. The comment is not specific as to precisely what is alleged to be conjectural or nonfactual.

The information presented in the Draft EIS is based on intensive research conducted in recent years by DNRC as well as other agencies and organizations. However, it is recognized that the Yellowstone Basin is a large and complex system which is not perfectly understood. Where statements are not supported

by statistically significant data, they are supported by the informed and considered opinions of qualified personnel.

COMMENT 121. A reservoir on the Powder River may improve the overall water quality, but it appears that this quality may still not be suitable for irrigation. This impact should be discussed.

Response. This impact is discussed on pages 278, 279, 282, 283, and 284 in the Draft EIS.

COMMENT 122. The impacts of lesser incremental instream flows were not considered although lesser incremental irrigation and energy alternatives were.

Response. Effects of differing levels of irrigation development were assessed because any future level is possible. Differing levels of instream flows were also identified (p.p. 300 and 301) and assessed.

COMMENT 123. No discussion or consideration is given to the possibility of diverting water near the mouth of the stream or river after it has served its instream values.

Response. Allowing water scheduled for consumptive use to flow the length of a tributary would have beneficial effects on instream values in that tributary. However, negative effects could occur below that point.

COMMENT 124. "We do not believe total conservation of resources is in the best interest of Montana or the nation."

Response. Conservation means the wise use of resources, taking into consideration the needs and wishes of all users, the social, environmental, and economic impacts of various uses, and the preservation of options for future decision-makers. Total conservation is not only in the best interest of the state and nation but is essential for the optimization of the quality of life for this and future generations.

COMMENT 125. Page 15. Why isn't a high level of agriculture development considered as an alternative?

Response. The Irrigation Emphasis Alternative is considered to be a high level of irrigation development and is described on pages 253 to 288 in the Draft EIS.

COMMENT 126. Page 20. Instream reservations could effect existing users who have not completely developed their water rights.

Response. Any approved water reservation is subject to existing water rights.

COMMENT 127. Page 123 and 124. What methodology was used to analyze TDS changes?

Response. TDS and streamflow data were correlated by regression analysis to estimate the historical relationships. The conservation of mass principle was applied to account for salts flowing into, flowing out of, and accumulating within a subbasin. The State Water Planning Model was used to perform the necessary calculations.

COMMENT 128. The municipal requests reflect population projections and per capita water use factors which seem high.

Response. The population projections accompanying the municipal applications were not supported by data or analyses.

The per capita water use figures (calculated by dividing the reservation requests by the population projections) are indeed high. These figures would be appropriate only where the municipal system also supported extensive industrial water use.

COMMENT 129. Page 248. Sediment inflow to Moorhead may be less than anticipated. What effect would this have on firm yield and the impacts presented in the EIS?

Response. Changes in sediment storage allocations does not materially affect the firm yield of Moorhead.

Department of Community Affairs

COMMENT 130. Charts displaying information on minimum flows, combinations of potential uses, and percentages of water use to various purposes should be included in the final EIS.

Response. Figures III-1 through III-10, and IV-1 through IV-14 are hydrographs that present much of the information suggested. In addition, the text discusses the implications of alternative water allocations.

COMMENT 131. The Final EIS should give a practical discussion concerning Indian water rights, Federal land water rights, and rights of Wyoming and North Dakota. Response. The Draft EIS contains a general description of those rights and how they may affect Montana's use. The situation has not changed. In each case the amounts of water reserved or allocated to the entities mentioned is unknown precluding a quantifiable discussion of their impacts. Also see comments 34, 64, 68, 70, 94 and 133.

COMMENT 132. The Final EIS should contain a brief discussion of options to solve the low flow problems in fall months.

Response. Water storage is one solution to providing more water during these months. Many offstream sites are available although detailed engineering and geologic studies need to be conducted to determine technical and economic feasibility. The costs of these offstream-sites preclude most users from building them. Several of these alternatives are discussed in the Draft EIS.

COMMENT 133. Are there plans to quantify Wyoming-Montana-North Dakota rights under the Yellowstone Compact?

Response. Montana has communicated with these states on the subject and plans to strengthen those efforts in an attempt to solve compact issues.

COMMENT 134. Show how much water DNRC is considering allotting to each water use.

Response. DNRC does not make water reservation decisions. Only the Board has that authority.

COMMENT 135. The planned or potential dams on the Tongue and Powder rivers should be discussed in detail.

Response. It is beyond the scope of this EIS to discuss the engineering details of potential dam sites on these rivers. However, this type of information is available from DNRC upon request.

COMMENT 136. The DNRC review cut some conservation district requests in half, strengthening the point that applicants have overstated their case.

Response. The DNRC has not in any way modified the water reservation applications. However, the amount of irrigation the DNRC forecasts in some counties varies from the acreages identified in the conservation district applications. Also see comments 12, 112.

COMMENT 137. Is an extension of the moratorium an important requirement to working out legal tangles?

Response. Proposed legislation to extend the moratorium has been submitted in order to give the Board more time to consider the reservation applications.

COMMENT 138. Page 13, paragraph 6. Where are potential storage locations? What are diversion and conveyance facilities? Where are suggested routes? Who would pay for these facilities?

Response. There are many potential water storage sites in the Yellowstone Basin. In the DNRC report, "Which Way?" is a map (page 18) which shows some of these. Diversion facilities are gravity systems or pumping plants designed to remove water from a stream. Conveyance facilities are canals, ditches, or aqueducts. There are no "currently suggested" routes although some have been studied by the Northern Great Plains Resource Program. Industry, in this case, would probably be required to pay all costs.

COMMENT 139. In view of the lack of legal protection and the inherent disadvantages, should this no-action alternative even be considered?

Response. The No Action Alternative is a projection of what might occur if no water reservations are adopted. Under this alternative, water use would continue through permits, and instream flows could receive no guarantee of water since that use cannot gain a water right by permit. This alternative was considered because it represents an option open to the Board.

COMMENT 140. Under the Energy Emphasis Alternative, would DNRC assign water in the same quantities and for the same uses as in the No Action Alternative (by permit rather than reservation)?

Response. DNRC does not assign water for any use through permits but only approves or denies permit applications.

COMMENT 141. The Draft EIS is accurate only if nothing much develops or happens in the next 23 years, i.e., between now and the year 2000. However, this is a highly untenable position.

Response. The EIS does not imply that development won't occur until the year 2000. In fact, the opposite is true. The alternatives and applications assume development throughout time, reaching the indicated levels by the years 2000 to 2007.

Intake Water Company

COMMENT 142. The environmental impacts of Moorhead dam and reservoir, named in the DNRC application, are not assessed, especially with respect to the following considerations:

1. Socio-cultural
2. Historical - archeological.
3. Aesthetics.
4. Economics, as required in House Joint Resolution No. 73, March 16, 1974
5. Wildlife.
6. Air quality.

Response. As indicated in the Draft EIS, the DNRC application did not specifically quantify amounts of water to be allocated to certain beneficial uses. The exact size and location of the dam and the amounts and places of use of the various water allocations were not specified because further studies are needed to detail those items. Therefore, the environmental effects of the proposal cannot be identified in great detail.

Included with the DNRC application was the "Reconnaissance Report on Moorhead Unit," USDI, Bureau of Reclamation, October 1969. Although the characteristics of the dam and reservoir considered in that report may not be identical to those eventually proposed by DNRC, the information therein gives the reader a perspective of the impacts associated with such a project. These and other impacts, beyond the scope of primary and secondary impacts as defined in the Draft EIS, are presented below for the reader's information.

1. Socio-Cultural.

Construction of the dam would provide a temporary (two-to-three year) source of construction jobs. A very small number of people would be retained thereafter for operation and maintenance.

Some of the water available from a reservoir such as Moorhead could be used for irrigation, and that use is identified in the DNRC application. Irrigation of new lands in the Powder Subbasin would tend to expand the present agricultural industry. The effects might be similar to those shown on pp. 154-157 of the Draft EIS.

Another potential use of water from such a reservoir is energy-industrial. The socio-cultural impacts of energy development are significant, and, although specific effects of possible energy development supported by Powder River water cannot be assessed, the following summary of general impacts is presented. These generalities apply to energy development anywhere in eastern Montana, unless otherwise stated.

The accouterments of energy development -- massive mining equipment and machines, coal storage facilities, generation or conversion plants, pipelines, railroad spurs -- are taxable. Hence, energy development generates revenues for state and local government. Whether existing mill levy rates would be decreased, resulting in savings for long-time residents, would depend on the ability of communities to supply the accompanying demand for services.

Hundreds of workers are needed for large energy developments, particularly during the construction of generating or conversion plants. Because of the limited local labor pool, energy development would require that a large number of workers migrate into the area, reversing the historical trend of net out-migration in the Powder Subbasin. This immigration could occur prior to 1980.

The jobs provided could alleviate unemployment problems in Montana to some extent. However, it is expected that shortages of Montana workers in certain required, skilled occupations would necessitate the recruiting of out-of-state personnel. In addition, coal-related employment would likely pay higher wages than the prevailing wages in other sectors; consequently, labor could be bid away from these sectors. This would be particularly critical in the agricultural and service sectors.

The influx of workers and their families would stimulate sales and activities of local businesses and commercial ventures. Additional secondary employment, especially in retail and service establishments, would also be created.

Communities affected by coal development would experience a growth in demand for services. None of the counties involved are capable of handling large population increases without major adjustment. Small communities are likely to be most affected, since their ability to absorb growth and finance services is more limited than that of the larger communities.

Services provided by nonprofit organizations would be strained by sudden population increases. Medical programs have been difficult to maintain in these communities; rapid development and growth would aggravate the situation.

If only limited coal-energy development occurs, some communities may have the capability to handle the small increases in demand for education, health care, recreational facilities, and other public services. With a large influx of people, communities would have to furnish temporary facilities, which may provide service of low quality.

During the construction phase of development, school enrollment would fluctuate greatly in affected communities. More stable enrollment could be expected during the operational phase.

Financing streets and highways would present problems for community and county governments. The cost of expanded or new community streets could exceed the cost of expanded educational facilities.

Mobile homes would have an important role in meeting housing demands. As the operational phase begins, the number of mobile homes would decrease, and the number of permanent dwellings would increase. A significant demand would probably be placed on the local building-construction industry, even if a substantial percentage of the new housing starts were mobile homes.

Initially, impacts of urbanization would be greatest on persons and communities closest to development sites and would diminish as the distance from the development sites increases. However, in the long term, all persons in the area would be affected to some extent.

If large influxes of "outsiders" move onto the Indian reservations, both resident Indians and resident non-Indians would become minorities within their surroundings. The present lifestyle, cultural values, and language of the Indians would be diluted. Out of this could come a diverse cultural experience, as well as a loss of existing Indian cultural values.

A major impact will result from the size of population growth within a short time. Large numbers of people with different values and orientations would move into the area. Congestion, crowding, and physical and mental stresses associated with rapid growth would be most severe during construction periods. These impacts are likely to reduce the perceived quality of life for many of the current and now residents.

The isolation of some plant and mine locations from urban centers together with the size of the work force raise the possibility of new town developments. Commuting could pose a problem in coal development areas.

One likely set of impacts is termed the "boom town syndrome." This involves a set of mental health symptoms and problems resulting from a sudden influx of people. Families are crowded together in mobile homes in strange environments, new families seek community acceptance, social cohesion suffers as alienation and emotional stress exacerbate each other, and crime rates, suicide attempts, divorce, drug use, and alcoholism tend to increase. As a result, the quality of life for both newcomers and residents is degraded.

The family as a social unit could be affected by changes introduced with energy development. Traditionally, the rural family has been a strong social unit. With urbanization and industrialization, the family would likely cease to be a basic unit for economic production. Individuals would seek employment outside of traditional family enterprises.

Rural communities have well-defined, long-established networks of social and political relationships. A likely impact would be the fragmentation of these patterns by the intrusion of large numbers of people, in effect creating new social orders. Another likely impact would be the dilution of the political power of traditionally dominant groups. Over time, new political alliances and groups would develop.

One notable effect that would occur among a sizable group of the existing population would be the creation of uncertainty about the future. This uncertainty would materially reduce the quality of the present for many persons.

2. Historical - Archeological.

Southeastern Montana is rich in Indian, military, and early settler history. Potential impacts on historical and archeological features cannot be assessed until comprehensive surveys are completed. These surveys are the responsibility of other agencies; DNRC can use the information only as it becomes available. Known sites are identified in detail in the Montana Historic Preservation Plan (Montana Department of Fish and Game 1975) referenced on p. 410 of the Draft EIS. No conflicts are apparent between the proposed development and known sites.

3. Aesthetics.

General discussions of aesthetics and recreation are included throughout the Draft EIS. See, for example, p. 284 for a discussion relative to the Powder Subbasin and irrigation development.

If a portion of the water from a project is used for energy development, then other impacts to aesthetics would be realized. Energy conversion plants, mines, powerlines, roads, railroads, water diversion structures, buildings, and scattered tracts of homes would all alter the aesthetic character of southeastern Montana. The overall impact would be one of gradual change from a quiet, sparsely inhabited, rural setting with wide open spaces to an area busy with industrial and human activity.

4. Economics

An economic analysis of the Moorhead site is included in the Bureau of Reclamation's Reconnaissance Report; however, eventual development may not proceed as evaluated therein, and it is impossible to present a meaningful cost-benefit analysis of the structure itself before the amounts of water to be allocated to various uses are established.

The feasibility of various allocations of Moorhead water to industry and agriculture may be analyzed based on the firm annual yield and updated costs information in the Bureau of Reclamation study. The following assumptions are based on that study:

1. The annual cost of construction and maintenance of the project would be \$5,990,000.
2. The firm annual yield of the reservoir would be 108,000 af/y. Montana's and Wyoming's shares would be 63,000 af/y and 45,000 af/y, respectively.

It is further assumed that Wyoming would market all of its 45,000 af/y to industry at a price of \$55/af and that Montana farmers would pay \$10/af for amounts shown below. Table 5 shows the amounts and prices of industrial water needed in order to provide \$10/af water to Montana farmers and pay for the project, based on the assumptions stated above.

Table 5 shows, for example, that if an industrial customer purchases 31,827 af/y (about enough water for two 1000 mw electrical generating plants) at \$100/af, then irrigators could receive 31,173 af/y at \$10/af, the price used by conservation districts in the irrigation feasibility analyses which led to the water reservation applications.

Water costs are such a small part of the total costs of an energy conversion plant (a thermal-electric generator, for example), it is unlikely that \$200/af would make such a project unprofitable. Other alternative sources of water, for example aqueducts or deep ground water, are thought to cost a similar amount.

TABLE 5

Water Market Program Needed to Justify
Moorhead Dam

Price to Industry, \$/af	Amount to Industry, af/y	Price to Agriculture, \$/af	Amount to Agriculture, af/y
\$ 55.46	63,000	10.00	0
60.00	57,288	10.00	5,712
70.00	47,740	10.00	15,260
80.00	40,920	10.00	22,080
90.00	35,805	10.00	27,195
100.00	31,827	10.00	31,173
110.00	28,644	10.00	34,356
120.00	26,040	10.00	36,960
140.00	22,034	10.00	40,966
160.00	19,096	10.00	43,904
180.00	16,849	10.00	46,151
200.00	15,076	10.00	47,924

An analysis of a water marketing program for High Tongue Dam would be similar to the one described above for the Powder.

A general discussion is possible of the significant impacts water reservation decisions will have on economic growth in the region and the distribution of benefits among different sectors. The alternatives considered can generally be classified into those that emphasize consumptive use of presently unallocated water for irrigation and energy (the No Action, Irrigation Emphasis, and Energy Emphasis alternatives) and the one (Instream Emphasis Alternative) that favors maintenance of presently unallocated water in the river. This is a choice between 1) reserving water to permit increased agricultural expansion and economic growth, and 2) reserving water for recreational and amenity benefits. The benefits from irrigation reservations go to the farmers who can expand their operations and to the businesses that sell to and buy from these farmers. The benefits from instream reservations go primarily to those who enjoy the recreational and amenity benefits of river-based activities and to the businesses that cater to these interests.

Comments received at the public hearings on the Draft EIS showed a conflict. Farmers believe that expanding their irrigation will be more valuable to them than the recreation and amenity losses they would suffer due to increased withdrawals. Recreational interests say they would benefit more from maintenance of instream flows than from the expansion of irrigation. It is clear that a decision on water reservations has important consequences with respect to the distribution of wealth. A decision favoring instream uses would benefit recreational interests and increase costs to farmers; a decision favoring irrigation would benefit farmers and increase costs to recreational users. A decision on reservations should not only compare total benefits and costs of the alternatives, but should also consider the distribution of those benefits and costs.

Reservations for instream uses will restrict the expansion of new irrigated agriculture; reservations for irrigation or the denial of instream reservations will not constrain future agricultural expansion.

Agriculture is presently the most important industry in the Yellowstone Basin. A constraint on agricultural expansion is a constraint on economic growth and new employment opportunities in that sector. Economic growth resulting from agricultural prosperity spreads benefits throughout the region. In contrast, growth resulting from recent industrial expansion, such as the energy development at Colstrip, tends to focus benefits and impacts at isolated, specific points. Some growth is necessary to prevent a decline in employment opportunities resulting from labor-saving innovations in the basic industries. It is unlikely that a decision restricting the availability of water for the energy industries would curtail future expansion in these industries; water costs are a comparatively small part of the costs of these projects, and water is available from other sources.

5. Wildlife.

The impacts of a reservoir in the Moorhead area on the fish and wildlife of the Powder Subbasin are described on p. 283 of the Draft EIS. An additional effect would occur with inundation of from 10,000 to 18,000 acres of mature cottonwood-willow vegetation type (as shown on Map I-5, p. 61 of the Draft EIS). Inundation would replace the terrestrial and flowing water habitats with a reservoir habitat.

Since some water from this project may be allocated to energy development, the following impacts of coal-related energy development on wildlife are presented. Similar impacts may result if the No Action Alternative is implemented. Again, the following discussion is general and would apply to industrialization anywhere in southeastern Montana.

One adverse impact of coal development on wildlife would be the direct loss of habitat resulting from mining and associated activities as well as urban development and associated human activities. As development occurs in habitat that presently limits a particular wildlife population, it will reduce that population in that habitat type. However, it is believed that the increased human population would have a more severe impact on fish and wildlife than would the habitat disturbance directly attributable to coal development.

Wildlife species would be subjected to the cumulative effects of several different categories of impacts caused by coal development. These include:

- a. Direct destruction of animals. This would result from actions which excavate, bury, overturn, clear, or grade large areas of previously undisturbed terrestrial habitat, or actions which cause dewatering of aquatic habitat, which results in the death of fish and other aquatic organisms.
- b. Habitat loss. Permanent habitat loss would result from such actions as construction of conversion facilities, transportation systems, and housing.

- c. Habitat impairment. Increased human activity would reduce the use of habitats; for example, habitat around human concentrations may be used only occasionally.
- d. Hazards introduced into the environment. Increased traffic would bring about an increase in road kills. Increased poaching could be expected. More fences would be constructed, resulting in more deer and antelope deaths. Increased penetration (including that of off-road vehicles) into remote areas would place additional pressures on wildlife.

6. Air Quality.

A reservoir in the Moorhead area could also affect air quality in the Powder Subbasin. Temporary disturbances such as dust would accompany construction of access routes and of the dam itself. Additional effects would result when the stored water is put to use; for instance, minor dust disturbances could also be expected as irrigation facilities are developed.

More severe degradation of air quality would result from energy development. Once again, some generalized impacts are discussed here for the reader's information, although it is felt that these impacts are far removed from the scope of the water reservations EIS.

Development of coal mines, coal conversion facilities, urban areas, and large land area disturbances would create multiple sources of various air pollutants. Major pollutants emitted from power plants and gasification plants include sulfur oxides, nitrogen oxides, carbon monoxide, hydrocarbons, hydrogen sulfide, photochemical oxidants, trace elements, and particulates. Some of these emissions are harmful to human health, animal and plant life, and materials.

Industrialization and associated population increases would increase the use of internal combustion engines. Engine emissions include carbon monoxide, hydrocarbons, nitrogen oxides, sulfur oxides, and particulates.

Plant stack plumes and an increase in dust could result in poorer visibility.

COMMENT 143. Applications 9941-r, 1781-r, 10,0006-r, 9931-r, 9933-r, 9934-r, 9947-r, 9943-r, and 9946-r do not meet the criteria of Water Reservation Rule 36-2.14R(1)-S1440.

Response. The applications listed meet the intent of the pertinent statutes and regulations.

COMMENT 144. The dates for the hearings to receive public comments on the Draft EIS were changed at the last moment, and insufficient notice was given to the public of such changes. Members of the public were thus misled and did not attend when they otherwise might have.

No court reporter was employed to record the comments presented at the public hearings. The only method of recording those comments was with a tape recorder, which was mechanically inadequate for that purpose. Moreover, the DNRC officials at the hearing announced that these comments would not be transcribed. Therefore, the comments will not receive consideration, as is required by law.

Regarding the hearing at Glendive, no list was kept of the persons who made comments, and no attendance sheet was completed; consequently, copies of the Final EIS cannot be mailed to these persons.

Response. Dates of the hearings were changed, but everyone who received notice of the original hearings was sent a notice of the change. A news release announcing the change was mailed to newspapers and radio and television stations throughout the basin; public service announcements were also distributed.

There is no requirement to employ a court reporter or to transcribe recordings of the hearings. In fact, public hearings are not required; however, due to the controversial nature of the water reservation applications, it was felt that public input could be enhanced by the four hearings.

DNRC employees took detailed notes of the comments presented at all hearings. At the Miles City, Billings, and Livingston hearings, attendance lists were circulated; a list was kept of the persons who made comments at the Glendive hearing.

COMMENT 145. The fees required for the preparation of an EIS, as provided by Section 89-8-102.2, R.C.M. 1947, were not paid by the reservation applicants, and, accordingly, all of the applications are void.

Response. Section 89-8-102.2, R.C.M. 1947 does not apply to water reservation applicants.

COMMENT 146. Water Use Act procedures 89-881 through 89-883, R.C.M. 1947, are actions taken towards approval of the proposed projects and were initiated prior to the time periods allowed in 36-2.2(6)-P240(5) (c).

Response. Initiation of those Water Use Act procedures by DNRC does not constitute action towards approval of the proposals by the Board.

COMMENT 147. Notice published by direction of Sections 89-890 and 89-881, R.C.M. 1947, was improper.

Response. That notice is not part of the EIS process.

COMMENT 148. The proposed DNRC project on the Powder River (Moorhead) cannot be accomplished because it requires water allotted to Wyoming under the Yellowstone Compact.

Response. Any reservation would be conditioned upon preserving Wyoming's water rights as stated in the Yellowstone Compact. Any project storing Wyoming's water or inundating land in Wyoming would obviously require coordination and cooperation with Wyoming.

COMMENT 149. The DNRC applications should not be considered until detailed engineering and economic studies are completed.

Response. In a sense, the Draft EIS is a simplified document, in light of the total volume of information available for its production. Nevertheless, certain data are not available with respect to individual reservation applications. Additional detailed information would be useful, but acquiring it is often not cost-effective, even if fee bill monies are provided by the applicant(s). It is DNRC's position that enough information is available in the Draft EIS for the Board to make an approval, denial, or modification decision on each application.

COMMENT 150. On p. 13, it is stated that energy-related companies are willing to invest in water storage, diversion, and conveyance facilities, and it is implied that they would do so if the Fish and Game Commission's request were granted in full. If the highest level of either the Fish and Game or the Department of Health requests were granted, would there be water available, even in flood periods, for storage, diversion, and conveyance on an economically feasible basis?

Response. Water would be available for storage even assuming both instream reservations were implemented; however, general economic feasibility cannot be determined. Such analyses would have to be conducted on a case-by-case basis, a task beyond the scope of the Draft EIS.

COMMENT 151. The Draft EIS has not considered, as an alternative, approval of the Intake Water Company's application for Moorhead Dam and reservoir.

Response. The impacts of Moorhead Dam and reservoir (built by whomever) are discussed in the Draft EIS and the response to Comment 142.

COMMENT 152. On p. 22, it is stated:

Most of the consumptive-use reservations, if approved, would be implemented over the next few years, as projects were built and water diverted.

This statement is untrue. For example, Application No. 9931-r, for irrigation by the Montana Department of State Lands, contemplates putting the water to a beneficial use in December of the year 2000. The same year is contemplated by the Powder River Conservation District and the 2007 by the North Custer Conservation District.

Response. The desire of the water reservation applicants is to put reserved water to use by these dates, rather than in these months or years.

COMMENT 153. Instream reservations are irreversible if downstream states apply the water to beneficial use during the time the reservations are in effect; conversely, consumptive reservations could never be implemented should downstream states apply the water to beneficial use before the water is put to use in Montana.

Response. See pp. 313 and 314 of the Draft EIS for a brief discussion of these issues. The comment represents a legal opinion concerning the acceptance of Montana's reservation doctrine by downstream states and federal courts.

COMMENT 154. Because Powder River water is too saline for irrigation use, no Powder River water should be reserved for this purpose; the Draft EIS should have discussed this issue.

Response. As pointed out in the Draft EIS (pp. 278-282), the waters of the Powder River are naturally saline. Even under the projected low level of irrigation development, salinities would increase to over 2,000 mg/l during several months at 90th percentile low flows.

As shown in Table I-7 on p. 55, waters with salinities of this order of magnitude indeed could not be used for many crops or many soils and, where used, would require extremely careful management. In addition, the application of saline waters could result in the accumulation of salts in the root zone, lowering the productivity of that land. However, careful water application and reservoir operation may mitigate these problems.

COMMENT 155. Under the regulations of the DNRC, the project must be a financially feasible undertaking.

Response. MAC 36-2.14R(1)-S1440, 2(b) indicates that the project should be financially feasible; however, since it is difficult to precisely predict future prices, returns, and technologies, each project will be considered on a case-by-case basis.

COMMENT 156. On p. 116, it is stated:

. . . DNRC has initiated action to adjudicate existing water rights in the Yellowstone Basin . . .

This statement is deceptive, for it does not say that the only area in which action has been initiated in a substantive way is in the Powder River Subbasin.

Response. Taken in context, the statement is not deceptive. DNRC has also initiated adjudications in the Tongue and Bighorn rivers and Rosebud and Armels creeks; however, adjudications on those streams are involved in litigation.

COMMENT 157. Full development of the lands anticipated in the Powder River, North Custer, and Prairie County conservation district applications would require construction of water storage facilities on the Powder River. The economic feasibility of this irrigation is linked to that storage. No economic information is given on irrigating these lands. The Draft EIS is therefore not site-specific in this regard.

Response. See the Draft EIS, pp. 154-157, and comments 142, 143, and 149.

COMMENT 158. Water quality may constrain irrigation development along the Powder River. Wouldn't using most Powder River water for industrial purposes be the best alternative?

Response. See comment 154. The analysis does not conclude that the best use of Powder River water is for industrial purposes.

COMMENT 159. The statements in the paragraph at the top of page 313 are wholly conclusory. The facts, data, information, and economics upon which these statements are based should be set forth.

Response. These statements are further explained on pp. 303-305 of the Draft EIS.

COMMENT 160. What sites were considered for Moorhead dam and reservoir other than the one proposed by DNRC?

Response. None. See the response to comment 151.

COMMENT 161. How can the economic feasibility of the Powder River, Prairie County, and North Custer conservation district applications be determined without knowing the cost of Moorhead water?

Response. A storage cost of \$10/af was assumed for the economic feasibility study of irrigating these lands, as indicated in the applications. See also comments 149 and 155.

COMMENT 162. In Item 4 of the DNRC applications, it is stated:

. . . the reservation request is submitted based on this stated amount (75,000 acre-feet for Montana's share of the Yellowstone River Compact water), subject to the condition that the Department reserves the right to amend its application at any time prior to the Board of Natural Resources and Conservation action on the reservation application, to reflect more current and specific information.

How can an EIS be written with any degree of specificity for applications that may be materially amended? The applications are being submitted to the Board for approval, and the EIS must accompany the proposal through the agency processes so that it receives consideration. If changes are made in the applications as stated in Item 4, the intent of MEPA and the rules and regulations promulgated thereunder is defeated. DNRC is the sponsor of these applications and the preparer of the EIS. Therefore, please relate what amendments are proposed to be made by DNRC, and what the environmental impacts of the amended applications would be.

Response. No amendments are yet proposed; however, if amendments are proposed which might materially alter the impacts set forth in the Draft or Final EIS, then a revised EIS could be published.

COMMENT 163. Is the Draft EIS an environmental impact report for water reservation applications, or is it the framework of, or comments upon, a state water plan?

Response. As stated on the cover, and made clear throughout the text, the Draft EIS is the Environmental Impact Statement for Water Reservation Applications in the Yellowstone River Basin.

COMMENT 164. If water supply is relatively scarce in the Tongue and Powder subbasins, why aren't the two DNRC applications involving these subbasins reviewed in detail in separate or site-specific environmental reports?

Response. These two subbasins are examined in detail in the Draft EIS. The EIS identifies generalized impacts that would be common to all applications or groups of applications (e.g., irrigation or instream) and addresses specific impacts of individual applications only where the anticipated impact is substantially different from the generalized case. Where significant impacts on specific parameters (e.g., reduced flow and dissolved solids) are identified and direct cause-effect relationships can be established, these parameters receive more attention in the Draft EIS.

Every detail cannot be included in an EIS. The Draft EIS attempts to reach a number of audiences, sacrificing some technical details to attain shorter length and greater readability, and it provides enough information, in the opinion of DNRC, for the reviewing public to grasp the basic issues.

COMMENT 165. How can a reasonable determination be made of the land available for irrigation for each conservation district based on such a general soil survey?
Response. Water reservation rules do not require extremely detailed soil surveys.

COMMENT 166. The quality (as indicated by TDS concentrations) of Powder River water would be degraded only if water were used for irrigation. The use of water for coal conversion would improve water quality.

Response. Analysis shows that increased water depletions by either agricultural or industrial development would increase the concentrations of TDS in the Powder Ri

COMMENT 167. A reservation, such as that requested by the Montana Department of Health and Environmental Sciences, would not alleviate low flow conditions; only new storage could accomplish that.

Response. The comment is correct. The instream flow reservations, if granted, would not make more water available during low-flow periods. They would, however, prevent increased frequency of low-flow events.

COMMENT 168. There is no evaluation of the impacts caused by increased irrigation and elimination of habitat on the wildlife in the area.

Response. The comment is evidently based on the Summary. Much of the remainder of the text of the Draft EIS is devoted to the impacts on the wildlife resource from increased irrigation. Increased irrigation would eliminate habitat for some species and increase it for others.

COMMENT 169. Secondary and socio-economic impacts are not discussed, nor is a benefit/cost analysis presented, for the Energy Emphasis Alternative.

Response. A discussion of the impacts, both primary and secondary, for the No Action Alternative (assumed to be the same as the Energy Emphasis Alternative) may be found on pp. 240-252. See also comment 142.

COMMENT 170. What methodologies were used by the two major instream flow applicants to ascertain the optimal amount of water to be left in the rivers and their tributaries?

Response. The Department of Health and Environmental Sciences' reservation request is aimed at meeting water quality standards. The methodology used was the State Water Planning Model, coupled with regression equations for flow versus TDS and sulphate as well as the concept of conservation of mass.

The Fish and Game Commission's reservation application has as its goal the maintenance of the status quo for fish and wildlife. The methodology included fundamental research on the life histories and habitat needs of the species involved and analyses of the relationships among flow and physical parameters which affect habitats, such as wetted perimeter, velocity, and depth.

COMMENT 171. The Draft EIS on p. 238 states that:

Water developed for energy will help commit Montana's coal reserves to extraction, an irreversible commitment of a non-renewable resource. The instream flow applications, on the other hand, might reduce the water available for energy development, slowing the growth rate, and extending the lifetime of the basin's coal reserves.

This is a self-serving statement and does not directly address itself to the important issue of irreversible and irretrievable commitments of resources in the basin.

Response. The quoted statement generally but accurately describes the coal resource commitments possible under water reservation alternatives.

COMMENT 172. Reservoir construction was probably not the phenomenon which caused a change in channel morphology in the Bighorn River because the dominant discharge hasn't changed.

Response. The comment is incorrect. The dominant discharge in the Bighorn River has been substantially reduced by Yellowtail Dam. It may be inferred that this change has resulted in the observed changes in channel morphology.

COMMENT 173. The farm budget analysis should be explained in more detail.

Response. See pp. 231-232 of the Draft EIS.

COMMENT 174. Table III-16 does not provide enough information to foster an independent analysis of the economic feasibility of the conservation districts' reservation applications.

Response. The Draft EIS is not required to, nor could it in practicality, include the applications in all their detail or the masses of data used to develop the information presented. The applications are available at DNRC to anyone who wishes to study them in more detail.

COMMENT 175. Nowhere in the impact statement are the results of the studies used to determine what effect reduced flow would have on the basin.

Response. On the contrary, much of the Draft EIS is devoted to discussions of the impact of reduced streamflows on such features as fish, wildlife, and vegetation.

COMMENT 176. The discussion of the irrigation scenarios is not detailed enough for the reader to determine whether the methodology is adequate.

Response. A detailed description is given on pp. 231-239. See also comment 173.

COMMENT 177. Much of the 237,472 acres included in the high level of irrigation development will never be irrigated without water storage. Only about 50,000 acres are feasible for new irrigation without further storage.

Response. The comment is incorrect. Significant full-service irrigation cannot take place without further storage in the Tongue and Powder subbasins. Storage costs were not assumed when financial feasibility was analyzed for those acreages. All other basin acreages (140,320) would not necessarily require storage.

COMMENT 178. On p. 242, the impression is given that all projects would proceed regardless of feasibility in the No Action Alternative.

Response. This impression is not correct and was not intended.

COMMENT 179. An environmental impact statement is supposed to make a judgmental decision on the impacts, not simply conclude that the impacts are impossible to determine.

Response. The Draft EIS is being criticized for being both "overly conclusory" (page 4 of Intake's comments) and non-conclusory. Similarly, DNRC has not assigned dollar values to losses due to specific impacts because no contemporary method of analysis is adequate.

COMMENT 180. No information is provided that would allow an independent determination of oxygen deficits.

Response. The comment is correct. The information in the Draft EIS is based on the opinions of engineers and biologists familiar with extreme stream de-watering phenomena.

COMMENT 181. The criteria used for determining impacts on the fishery are not explained.

Response. The impacts were estimated, based on intensive research leading to an understanding of the life histories and habitat needs of the game and other fish species of the Tongue River.

COMMENT 182. The Draft EIS gives the erroneous impression that technology is not available to make saline water suitable for municipal and domestic uses, but is available for making saline water useful for industrial purposes.

Response. This impression is not correct and was not intended.

COMMENT 183. Why would Powder River water be unacceptable for irrigation use at least one year out of two under the projected low level of irrigation development?

Response. Table IV-15, p. 282, and Table I-7, p. 55, document this conclusion.

COMMENT 184. There is a conflict between the two sentences which explain salt balance and then show a salt pickup from irrigation return flows.

Response. There is no conflict. Conservative salt-pickup assumptions were made to show that, even under those assumptions, TDS concentrations would increase. Also, the relative effects of these assumptions during critical months were reported.

COMMENT 185. The reader of the Draft EIS is not able to make an independent determination that the large and real (instream) values referenced where would be foregone.

Response. The Draft EIS describes the Yellowstone River basin in sufficient detail to allow the reader, based on his or her system of values, to independently determine whether the various changes described would be beneficial or adverse.

City of Livingston

COMMENT 186. Table A-5, p. 407, indicates zero growth for the Livingston area. Steady growth in recreation, plus growth in agricultural and business communities, indicate that Livingston will increase in population.

Response. Table I-21 (p. 101) shows that the population increase in Livingston has been 7.9 percent since 1970. Population projections included with the Livingston water reservation request are shown on p. 174 and were used to judge relevant impacts; in this case, impacts were negligible. The DNRC (and other) projections show little increased population for Livingston based on long-term population trends, including a 10 percent drop from 1960 to 1975.

PART VI
APPLICANT RESPONSE TO COMMENTS
ON THE DRAFT EIS

INTRODUCTION

Comments on the Draft EIS were received by DNRC until January 12, 1977. All written comments were immediately mailed to all water reservation applicants who, in accordance with DNRC's rules under the Montana Environmental Policy Act, were allowed until January 21, 1977 to respond to the comments. All applicants were contacted by telephone to ensure that each understood the process and the deadline involved.

Only two applicants chose to respond to the comments: the Department of Fish and Game (for the Fish and Game Commission) and the City of Billings. Their responses follow.

STATE OF MONTANA



DEPARTMENT OF

FISH AND GAME

Helena, Montana 59601
January 20, 1977

RECEIVED

JAN 20 1977

MONT. DEPT. OF NATURAL
RESOURCES & CONSERVATION

Mr. Wayne Wetzel, Environmental Coordinator
Department of Natural Resources and Conservation
Helena, Montana 59601

Dear Wayne:

Following are our responses to comments made by persons who submitted written and oral comments on the Yellowstone reservation draft environmental impact statement. A brief summary of the comment is followed by our answer to that comment. The page number refers to the page of the commenter's comments and not to the page in the EIS.

COMMENTS TO THE WRITTEN COMMENTS ON THE EIS

Loble, Picotte & Pauly

Comment: Pg. 7, paragraph 3. Aquatic resources, including fisheries could possibly be benefited if Intake would build Moorhead Dam.

Answer: Although this is possible, it is a speculative statement in that there is no indication that Intake could, or would, release flows requested by F&G which we feel are those required to maintain the fishery in the Powder River.

Comment: Pg. 8, paragraphs 1-2. Both consumptive and instream uses are irreversible and irretrievable because downstream states will put the water to use before Montana puts it to use by the year 2000.

Answer: In the case of the instream water use, water would be put to beneficial use immediately upon granting of the application, rather than by the year 2000. Downstream states would thus have to put the water to use beyond the Montana state line, rather than picking it up within Montana.

Comment: Pg. 18, last paragraph. Use of a majority of Powder River water (by building Moorhead Dam) by industry would be the best use because salinity problems would make it infeasible and possibly uneconomical to irrigate lands. Also, fisheries would benefit from instream flows below Moorhead Reservoir.

Answer: Again, it is assumed that suitable flows would be provided below Moorhead Dam. There is no guarantee that flows acceptable to Fish and Game would be released to maintain the downstream fishery. There appears to be insufficient data to know what water would be available for industrial use from Moorhead and what instream flows could be provided. Therefore, construction of Moorhead Dam and use of Powder River water for industry is not "by far the best alternative" as stated. Any project requiring construction of Moorhead Dam should not be considered feasible until instream flows which are adequate to maintain the fishery are guaranteed in the operation of the project.

Comment: Pg. 19, paragraph 2. Refers to water being lost to downstream states by implementing an instream reservation.

Answer: It must be remembered that instream uses of water are beneficial under Montana law. The only way aquatic resources can benefit from water reservations is by keeping water instream for that purpose. It should not be considered that "water will be wholly lost to Montana..." when in fact the water was used beneficially within this state. What is the impact to Montana of not maintaining suitable instream flow for beneficial uses?

Comment: Pg. 21, paragraph 3. Reference is made to possible enhancement of fish and wildlife from Moorhead Reservoir. Conversely, any discussion of enhancement should also include a discussion of adverse effects on fish and wildlife from construction of the dam and reservoir, no matter who constructs it.

Comment: Pg. 22, paragraph 3 and 4. Commenter states that the effects of Moorhead Dam and reservoir on fish and wildlife, particularly with reference to loss of mule deer range, should be discussed as well as a discussion of mitigative measures.

Answer: Any contemplation to build Moorhead Dam by a government or private agency should consider the possible environmental effects of the project on fish and wildlife and provide for suitable mitigative measures to alleviate these effects or enhance these values.

Comment: Pg. 29, last paragraph. Suggests water quality in the lower Yellowstone and Missouri rivers would be improved if industry were allowed use of Powder River water for coal conversion.

Answer: Again, there are other considerations. What effects would industrial depletions for coal conversion have on the fishery

and other aquatic life in the Powder River? What data are there to show water quality would be improved as far away as the Missouri River? What would the extent of the improvement be, if any?

Comment: Pg. 30, paragraph 1 and 2. Commenter states that economic qualification of fish and wildlife values should be done regardless of the difficulty involved.

Answer: It appears the commenter wants to obtain comparative dollar values no matter what those quantities might be or no matter if they are accurate, reasonable, or logical values. His example in paragraph 2 of using \$3 per fisherman day is a completely arbitrary value to arrive at 2,560,000 recreation days. Obviously if each recreation day were worth \$50, then the number of visitors would need be only 154,000. Fish and Game has data in its reservation application (Appendix D, Table 1, pg. 299) to show that between May 1975 and April 1976, an estimated 237,980 angler days were spent on the mainstem Yellowstone River and its principal tributaries, not including use on smaller tributaries.

The entire comment by this commenter reflects the ease with which dollars can arbitrarily be pulled out of a hat for whatever purpose is necessary. Copeland and Stroup (1976)^{1/} discuss this very problem of determining values which adequately reflect the real visitor day situation. Additionally, the commenter's analysis assumes that all values are to be measured in dollars and cents; i.e., the water use which generates the most dollars is that which is in the best public interest. We believe this is not the case, and that some natural resources have a value which cannot be measured in those terms.

Senator Pete Story

Paragraph 4. Senator Story's statement that Fish and Game has never actually studied Fridley Creek is incorrect. During the upper Yellowstone and Shields River planning studies between July 1972 and September 1975, Fridley Creek was sampled at its mouth to determine if fall spawning fish were using the stream for spawning. Permission to sample the stream was obtained

^{1/} Copeland, M. and R. Stroup. 1976. Problems in estimating the fish, wildlife and recreation value of the Yellowstone River. Dept. Agric. Econ. and Econ. Mont. St. Univ., Bozeman. 43 p. Mimeo.

from Mrs. Story. Whitefish were found spawning in the section of stream from its confluence with the Yellowstone River to approximately 350 feet above its mouth. Water entering the Yellowstone River was originating from the Fridley Creek drainage, although it may not have been flowing in the original natural channel of Fridley Creek.

Montana Power Company

Comment: Pg. 3, paragraph 4. Implies that unless recreation were expanded to its full potential on the Yellowstone River there is justification to modify the reservation, if granted.

Answer: Recreation is only one of the beneficial uses for which the reservation was requested. The reservation is also needed for the preservation of fish and wildlife, per se, in and along the river, which does not necessarily have a relation to recreation. On page 2 of Fish and Game's reservation request, one of the purposes of the reservation is "for the benefit of the public for fish and wildlife uses," specifically to "provide fish and wildlife habitat sufficient to perpetuate the diverse species comprising the natural resource at levels comparable to current existing levels." Thus these other considerations would appear to be important before an instream reservation could be modified by the Board of Natural Resources. Further, recreation facilities would not necessarily have to be expanded in order to expand recreation in the basin as implied in the last two sentences of this paragraph.

Utah International, Inc.

Comment: Pg. 7, paragraph 1 and 2. Paragraph 1 says sediment "would be reduced only slightly from that which naturally occurs." Paragraph 2 says "much of the coarser silt can be excluded from the water diverted..." Aren't these two statements contradictory to one another? What will happen to the coarser silt excluded from the diverted water? Will it not be available to be carried downstream at high flows, thus not allowing it to be "reduced only slightly?"

Hurlburt, Kersick & McCullough for the 13 Soil and Water Conservation Districts - (pages were unnumbered)

Comment for pg. 158 of EIS. Tennant's method uses a percentage (10%, 30%, 60%, etc.) of the average annual flow at a stream point to recommend flows. HKM should clarify how they arrived at their instream

flow releases. An instream flow of 10% of average annual flow is a minimum, short-term survival flow according to Tennant, and this is not a satisfactory flow release for long-term survival of aquatic populations. A storage project using this type of flow release would not benefit fisheries in the stream blow.

Their comment for pg. 241, paragraph 2 of EIS. Historical low flows probably did have a short-term effect on the aquatic environment, even though the species haven't been eliminated. However, we contend that should future diversionary water use, coupled with current use, deplete the streams further, then those low flow periods would occur more frequently and aquatic populations would not recover as they did in the past when higher flows occurred following an extreme low water period. "Utopian" conditions for aquatic resources will not again occur in the foreseeable future. Fish and Game's request is to try and maintain the current level of fisheries production which is already somewhat less than "utopian," particularly in some smaller, already dewatered tributaries to the Yellowstone River.

Their comment for pg. 242, paragraph 4 and 5 of EIS. Paragraph 4. We fail to see where the comments in the EIS are contradictory to Fish and Game's request. The reservation request is intended to maintain the status quo as closely as possible, and the more reduction there is below those requests, the more the risk of loss to fish and wildlife over the long term. The EIS simply says the impacts will be minor on the upper mainstem and more severe in some smaller tributaries.

Also, the suggestion by HKM that, even though some species of diatoms may be harmed by flow reduction, everything will be all right, because other species will benefit, shows a lack of sensitivity toward ecological functions. Although we might agree this would occur, one must look beyond the diatoms themselves to foresee the impacts on the entire ecosystem. "Everything is related to everything else" is a truism in the natural environment, and to say otherwise is not to understand those complexities.

Their general comments on EIS. Paragraph 1. Our comment here is the same as our previous comment on their comment on page 241, paragraph 1 of the EIS.

Paragraph 4. Our reply to this is that many Montanans are already paying the price to live among our free-flowing streams by receiving lower salaries, fewer services, etc. than they could have by living in a more highly populated and developed area. If the benefits of living in Montana are why many people live here, why should they deliberately make it a less desirable place in which to live in order to make a better living? The comment seems contradictory.

WRITTEN COMMENTS TO THE ORAL COMMENTS RECEIVED AT THE PUBLIC HEARINGS
JANUARY 4-7, 1977

Comment: Fish and Game wants to stop economic growth.

Answer: Fish and Game's request is not to stop economic growth, but to maintain those resources we are responsible for, and upon which a large segment of the public depends both for recreational and economic reasons. Recreation is also an important industry in Montana and this industry depends in large part on aquatic resources which are maintained by instream flows. The purpose of the request is to maintain those flows.

Comment: Fish and Game has requested too much water.

Answer: True, large quantities of water are involved in our instream requests. However, they are necessary because of the nature of the request. Stream channels require relatively large amounts of water to maintain aquatic resources. The Yellowstone River, for example, is a large river. Aquatic populations have evolved to their current levels due to a wide range of flows, including extreme highs and extreme lows. The habitat these species need has evolved from those flows. Thus to maintain the status quo, somewhat comparable flows are necessary to adequately fill up the stream channel and maintain adequate habitat.

A comparison has been made of Fish and Game's 8.2 million acre-feet (mmaf) flow request between the Powder River and North Dakota and the 8.8 mmaf/yr average flow at the USGS gage at Sidney (at the 1970 level of development). The 8.8 mmaf is an average figure and does not necessarily reflect the flow in any given year. For example, in 1975 the flow past the Sidney gage was 13 mmaf. Between 1970 and 1975 the average flow was 11 mmaf. In all years, Fish and Game's 8.2 mmaf request would remain the same. Admittedly there will likely be low years when less than 8.8 mmaf will occur. In those years prior water uses will get their water needs satisfied first before the instream reservation is met. The intent of the reservation is to temper the future use of the water for diversionary purposes so that fish and wildlife populations can be maintained at suitable levels.

Comment: A lady who ranches on Flathead Creek in the Shields River asked at the Livingston hearing why a reservation for fish was even necessary in Flathead Creek. She said the fish there were doing fine and they allowed fishermen to fish on their property.

January 20, 1977

Answer: Again, the request is to maintain sufficient flows so that future water uses will not lower streamflows to a point which would be detrimental to those populations over the long-term future. TW

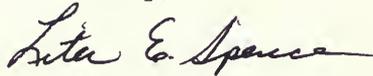
Comment: Why doesn't Fish and Game store water for use instream if they need the water so badly?

Answer: Fish and Game is not necessarily opposed to storage. We will remain opposed to any storage projects on the Yellowstone mainstem, but offstream or small watershed storage projects would not necessarily be viewed in the same light. However, participation in such projects would depend on the location and operation of those projects. We would reserve the right to review potential storage projects to determine their environmental compatibility and the benefits they would provide to fish and wildlife through instream flow releases.

Comment: Irrigation is beneficial to fisheries because return flows hold up late season water levels.

Answer: Although this is true in many instances, this late season water results from spring and summer diversions which reduce streamflow. When streamflow is reduced in midsummer when air temperatures are high, dewatering may have adverse effects on fisheries that improved fall flows cannot overcome. Low flows in fall are not as detrimental as low flows in summer because water temperatures are cooler and cause less stress to aquatic organisms. Providing more water in the fall by diverting more in the summer is not necessarily a fair trade-off.

Sincerely,



Liter E. Spence
Water Resources Supervisor

LES/sd

Calton and Stephens, Ltd.

COUNSELORS AT LAW

CALVIN A. CALTON
ROBERT L. STEPHENS, JR.

SUITE 226 HEDDEN-EMPIRE BUILDING
206 NORTH 29TH STREET, BILLINGS, MONTANA 59101
406 246-2691

January 19, 1977

RECEIVED

JAN 21 1977

MONT. DEPT. of NATURAL
RESOURCES & CONSERVATION

Montana Department of Natural Resources
and Conservation
32 South Ewing
Helena, Montana 59601

Attention: Mr. Gary Fritz

Re: Comments - City of Billings - E.I.S.

Dear Mr. Fritz:

Enclosed please find Comments by the City of
Billings pursuant to our telephone conversation of
yesterday, January 18th.

Cordially,

CALTON AND STEPHENS, LTD.

CAC:ss
Enc.

By *Calvin A. Calton*
CALVIN A. CALTON
Public Utilities Counsel

CC: Mr. Gerald D. Underwood
Mr. Willis Jones

REVIEW COMMENTS ON
DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR YELLOWSTONE WATER RESERVATION APPLICATIONS

Submitted by the City of Billings, Montana

Dated: January 19, 1977

To: Montana Department of Natural Resources and Conservation
32 South Ewing
Helena, Montana 59601

FOREWORD

The City of Billings has, in general, little quarrel with the Draft Environmental Impact Statement. It appears that the Draft Environmental Impact Statement for Water Reservation Applications prepared by the Montana Department of Natural Resources and Conservation is an exhaustive attempt to measure a multitude of elements impinging upon the Yellowstone River Basin waters. In general and in particular, in most instances, we commend the Montana Department of Natural Resources and Conservation on a job well done. There are only three specific areas upon which the City of Billings finds need of comment. Those are:

1. General environmental effect as relates to the City and its citizens.

2. The effect of City sewage treatment on the quality of the Yellowstone River downstream from the City of Billings.
3. Justification of the extent of the City of Billings application for reservation.

COMMENTS

1. General environmental effect as relates to the City and its citizens.

One of the things of which Montanans are justly proud is the ability to enjoy a largely unspoiled nature in a way not available to many of our fellow Americans. With the population of the City of Billings composing a substantial part of the population of Montana, it is, of course, to the interests of our City and its citizens that our immediate environment, including the Yellowstone River, remain unsullied so far as possible. We commend the thoroughness with which the Department of Natural Resources has drafted the Environmental Impact Statement.

2. The effect of City sewage treatment on the quality of the Yellowstone River downstream from the City of Billings.

We are particularly pleased to note at Pages 56 and 57 of Volume I of the E.I.S., the observation that improved treatment of the municipal and industrial discharges at Billings "has resulted in a marked improvement in recent years". As you are no doubt aware, Billings' \$17.5 M. secondary treatment facility is presently in the process of being put on line. This has represented a substantial investment by our community and its operation, which will not be inexpensive, represents a continuing investment in the water quality of the Yellowstone River Basin, which we think should not go unnoticed. We have encountered some problems in working out the operations, but have no question that these technological problems will be solved and our contribution to the enhanced water quality of the Yellowstone will be quite considerable.

Any discharges by the City of Billings must meet the requirements of its NPDES Permit issued by the State Board of Health, and these are being met and will continue to be met by this City.

3. Justification of the extent of the City of Billings application for reservation.

At Pages 100 and 101, certain population and economic data is considered which depicts the prominent place of Billings and Yellowstone County in the number of

people which would be affected by the water quality of the Yellowstone River Basin. The charts at Pages 102 and 103 also depict the income status for the counties in this region. A very recent study has been completed by the University of Nebraska, of which we have not yet received a copy, but information concerning which was published in The Billings Gazette, issue of January 16, 1977. A true copy of that article is attached to this report and made part hereof.

In this connection, we point out that there has never been an occasion of a population loss by the City of Billings over its history so far as we are aware.

We note that both the comment by the Department of Natural Resources at Pages 173 and 1974 of Volume I, and at Page 215 of Volume I, seem to suggest the Billings application is excessive. The comment of a consulting firm, Hurlbut, Kersich and McCollough, recently received by the Department of Natural Resources states that "the City of Billings' request is totally unreasonable as insinuated later in the report".

We have considerable objection to this type of statement. In discussing with one of the consulting engineers the City of Billings' future water needs, it was purported to restrict any scope of the application to about

ten years in the future.

We do not know how any reasonable person can believe that the City's water needs will cease at a point ten years in the future or become static thereat. We can point to the example of Denver as a regional metropolis enduring substantial growth and costly water problems over the years, including extensive engineering to secure western slope waters.

As stated very clearly in City and County of Denver v. Sheriff, 96 P.2d 836, (Colo. 1939):

"The concern of the city is to assure an adequate supply to the public which it serves. In establishing a beneficial use of water under such circumstances the factors are not as simple and are more numerous than the application of water to 160 acres of land used for agricultural purposes. A specified tract of land does not increase in size, but populations do, and in short periods of time. With that flexibility in mind, it is not speculation but the highest prudence on the part of the city to obtain appropriations of water that will satisfy the needs resulting from a normal increase in population within a reasonable period of time. 'Courts are not to shut their eyes to the realities of business life.'"

If the City is charged with taking such steps, it seems to us that DNRC is in a similar position with respect

to determining what future requirements of Montana citizens might be, including citizens of Billings.

A recent University of Nebraska study just referred to shows that the population gains of the City of Billings are of substantial scope and import. The only limitation that could ever be assessed on a City that has had a historic growth pattern such as Billings is by limiting any reservation to meet a projected or guessed at population as of a certain year in the future. If anyone can demonstrate a secure prediction of City of Billings growth to a static population, then comments as to excessive reservation might be then in order.

All the ingredients are available in the character of the present development of the City of Billings to make its future prospects seem of great import. At least certainly, of great import to the State of Montana. We can also point to the growth of industry in Eastern Montana and the relative position of the coal fields as to growth potential we may have in the future. We would understand a water reservation need not require that the City will immediately use that amount of water, but that at some time in its future, it is reasonable to assume that it will use such water. Most other Montana communities that can be considered have had either a static or negative growth sometime in the past. This is not the case with Billings.

If any reasonable scope is to be given to planning for municipal needs, the City should look not only ten years in the future, but at least fifty and perhaps even a hundred years in the future. Who can say what the scope of that development will be, but we do have a historic growth pattern on which to base our expectations thus far.

As far as limiting the amount of water to be used per citizen, we point out that industrial use may at some time develop a means of using far more than the DNRC assumed 200 gallons per day per person. Such industrial uses within the City would be provided by City water requirements and would be part of its uses.

At Page 173 of the Environmental Impact Statement, the DNRC, by assuming an average daily per capita diversion of 200 gallons, reaches the conclusion that the quantity of requested water by the City of Billings "would serve a population of about 1,500,000, about twice the 1970 population of Montana". First, the 1975 per capita daily use of Billings exceeds the "200 gallons" assumed figure and is expected to increase substantially in the future. More importantly, the maximum per day consumption per capita of the City was 578 gallons per day in 1975. Current projections put this figure to 672 gallons per day per capita by 1990. These usages are expected to increase steadily in the future. Since any reservation must meet the maximum

daily usage, not just the average, the City of Billings submits these assumptions must be utilized. Based on such criteria, the projected population of the City of Billings to be served by its requested reservation would be in the area of 350,000 to 500,000 population, depending upon the steadily increasing consumption and the time frame involved, looking ahead 50 or even 100 years.

We think that the City of Billings rights and entitlement to the Yellowstone River water ought to be recognized to be paramount, both because of the number of people involved in the City of Billings, and because of the steps the City has taken to reduce its impact on the environment as above set forth. And finally, it seems that people ought to be given perhaps a modest degree of precedence over other uses that might be made of the water, including that of out-of-state downstream users.

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